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AUGUST 1994

Macworld

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Power Mac 7100

A ★★★★★ Winner
for under $2900, Page 58

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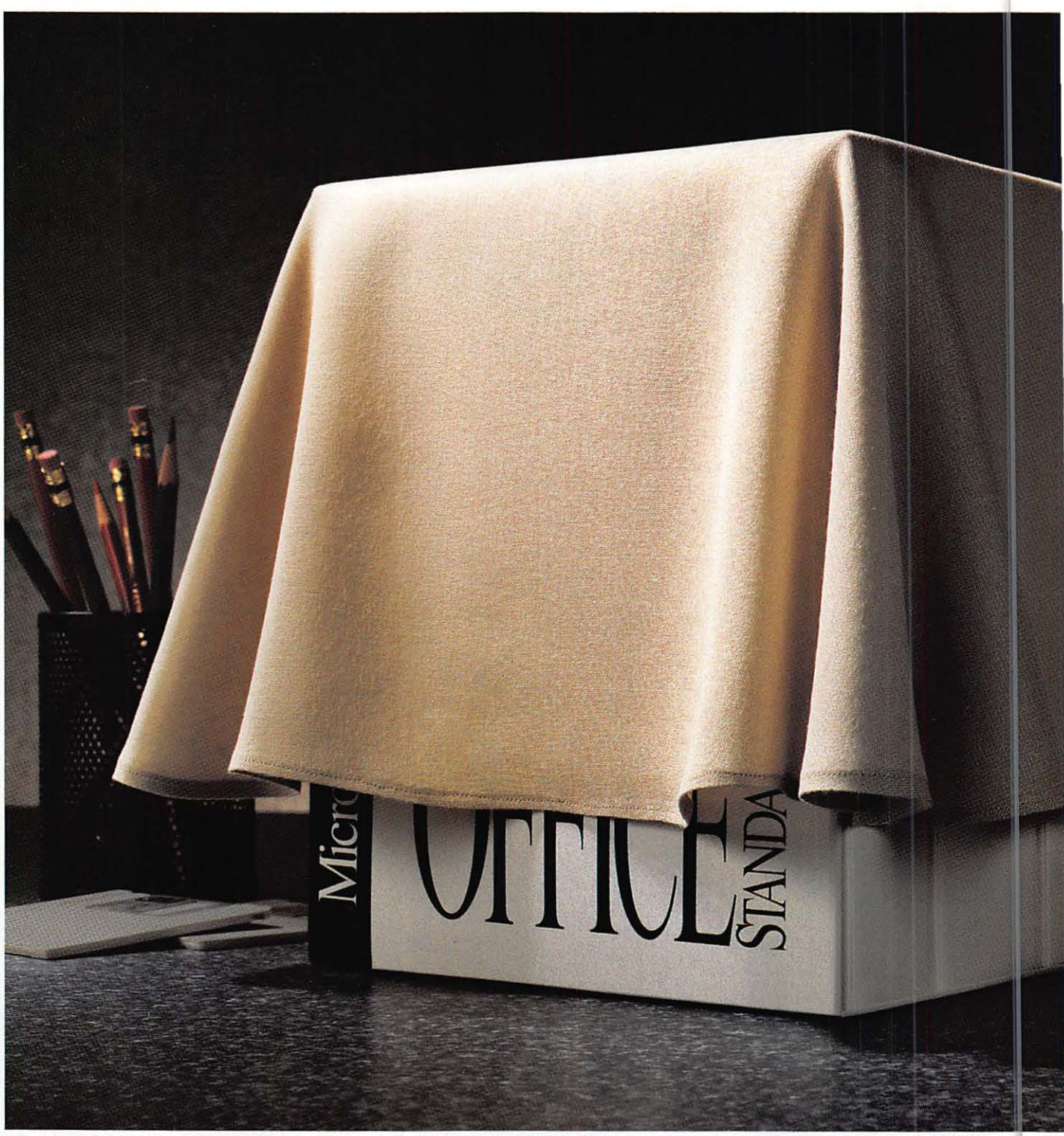
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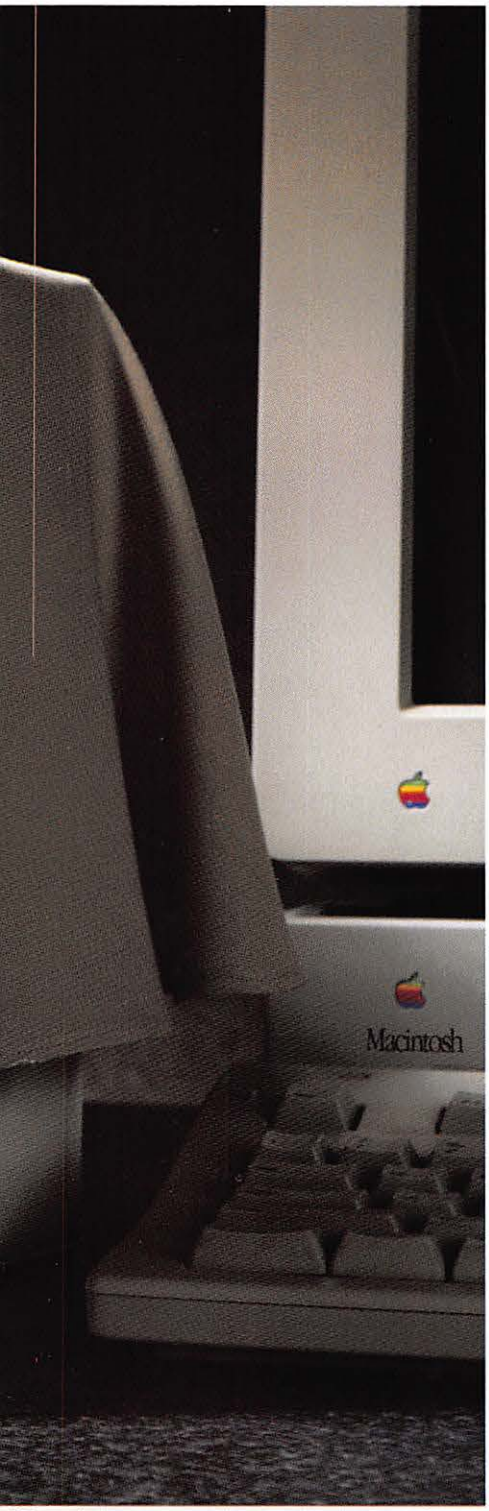
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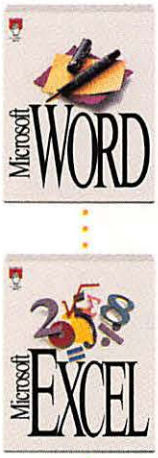
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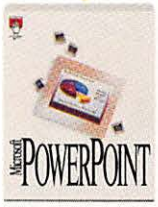
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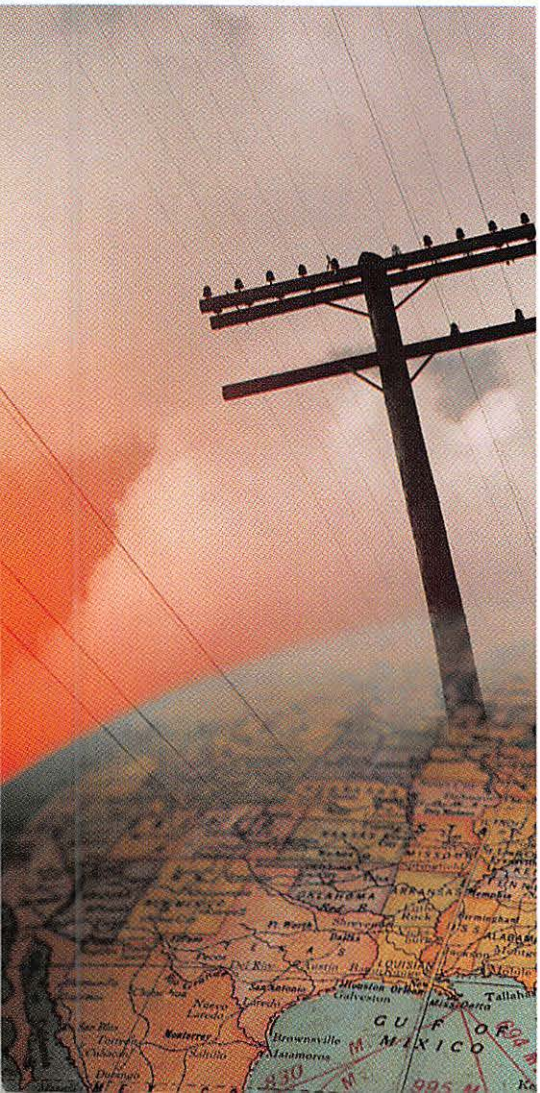
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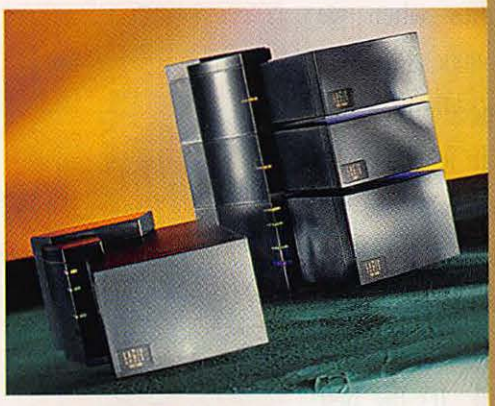
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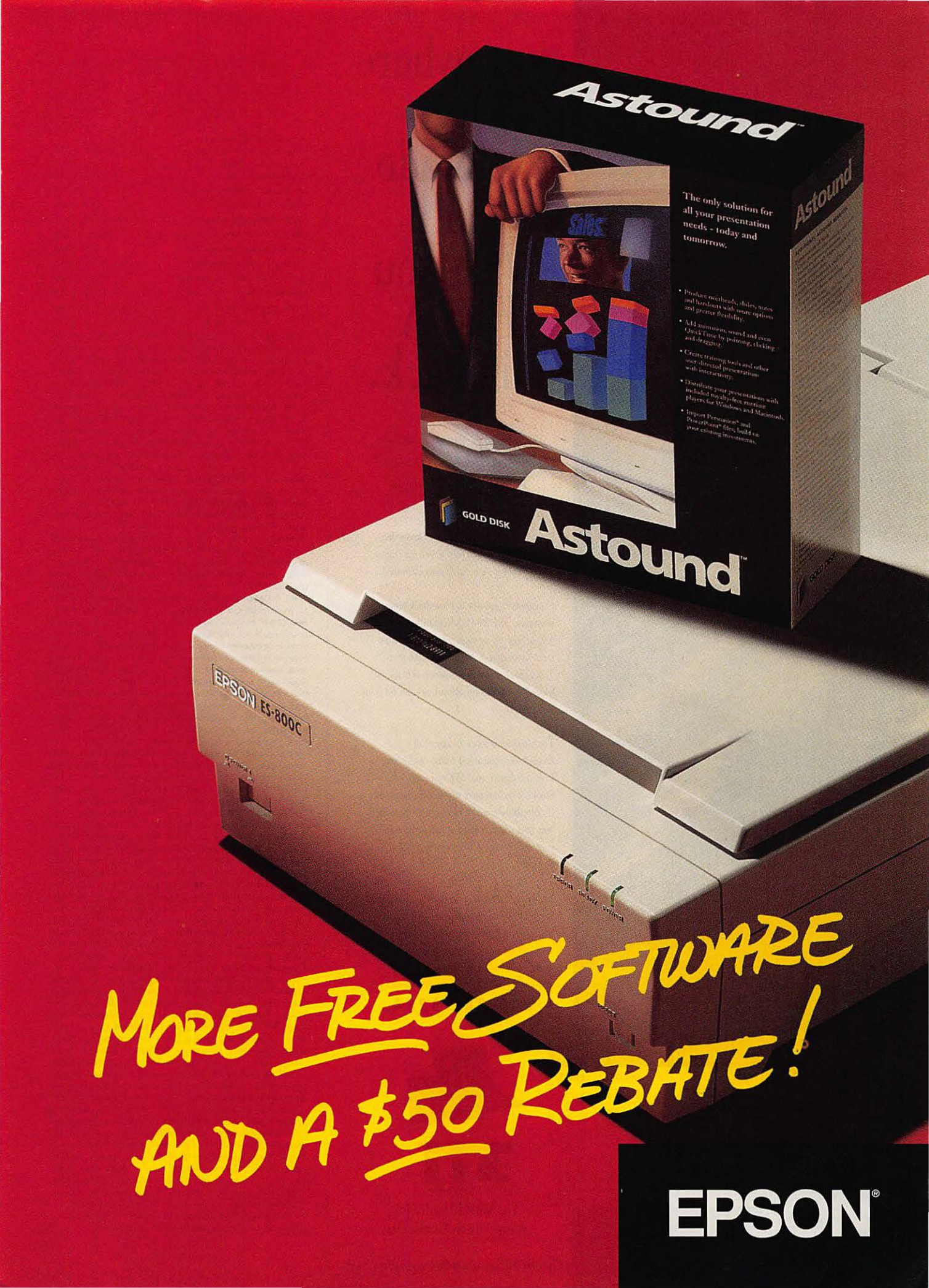
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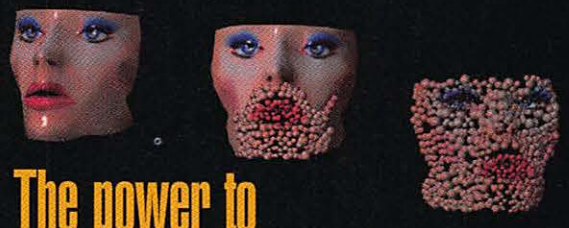
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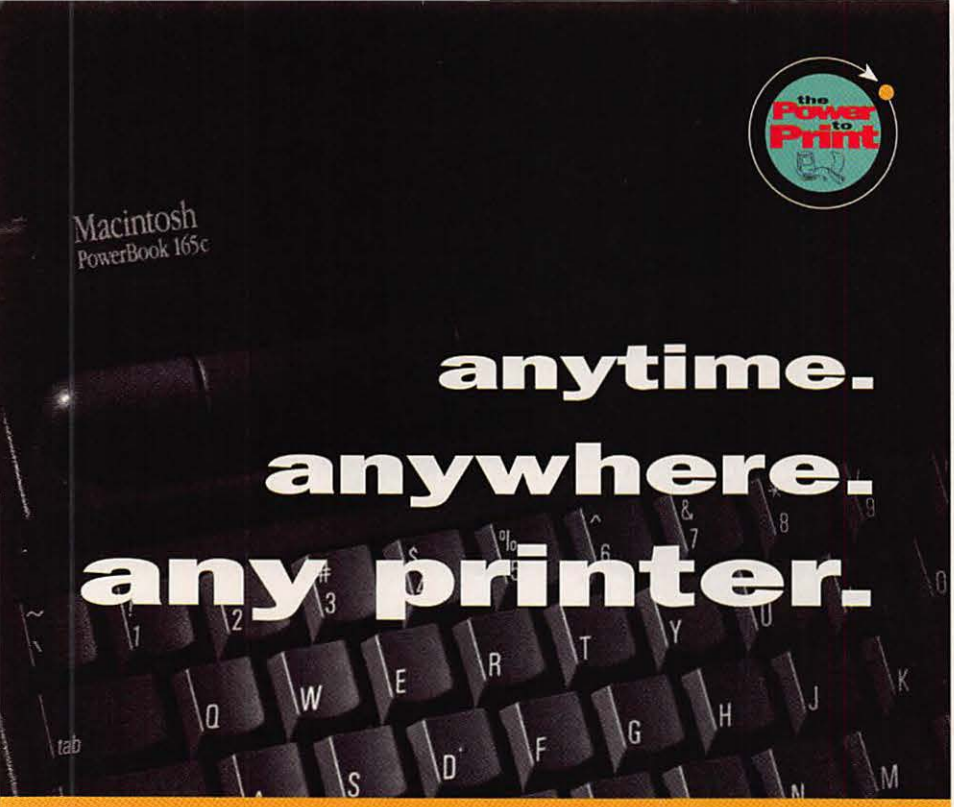
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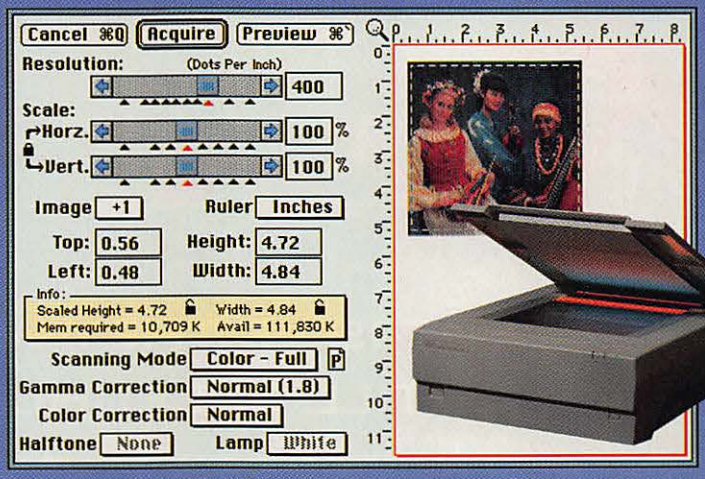
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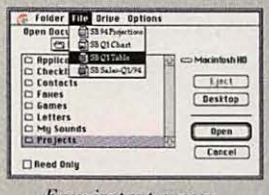
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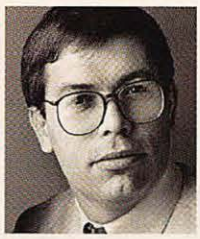
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BY ADRIAN MELLO

Beyond the Power Macs

Charting a course for Apple's continued success

UNDER THE SURFACE OF THE Macintosh market the twin streams of optimism and doubt flow perpetually. The brilliance and refinement of the Macintosh design continue to inspire users. At the same time, the foreboding mass of the PC market, roughly ten times the size of the Mac market, always seems to raise doubts about the Mac's long-term survival. Ten years have passed since the Mac's introduction, and these currents continue to ebb and flow. The introduction of the Power Macs is a major milestone. It's time to reexamine the challenges facing Apple.

The Power Mac Success

Ninety days after the introduction of the Power Macs, it appears that Apple has done a phenomenal job of managing the transition to the PowerPC architecture. The machines are selling extremely well, and Apple has by and large kept up with demand. The Power Macs offer an unprecedented price/performance value. According to a *Macworld* price survey, two of the three Power Mac models (the 6100/60 and 7100/66) meet or exceed the price/performance of similarly configured Intel Pentium–based PCs (see *Power Mac News*, this issue). And there are no major software-compatibility problems, a remarkable achievement considering the changeover to RISC. This is the first time a mainstream personal computer platform has converted architectures and maintained the usability of and investment in the installed base of applications. By early autumn most major Mac applications will be available in native Power PC versions, which means more users will buy Power Macs without hesitation. Furthermore, by successfully partnering with IBM and Motorola to create the PowerPC processor family, Apple has demonstrated that it can build and sustain strategic alliances of a scale necessary for its future survival.

But despite the reinvigorated hope that the PowerPC has provided for the Macintosh, more challenges lie ahead. And since optimism and doubt about the Mac go hand in hand, let's anticipate some of the doubts. The impending introduction of Chicago (the next version of Microsoft Windows) will test whether the Mac offers enough unique value to users for them to swim against the DOS/Windows tide. As always, Mac and PC users will spend many fruitless hours arguing their convictions. What must Apple do to put these arguments to rest? The answer is not new: Apple must continue its quest to significantly increase its market share while strengthening the unique advantages of the Macintosh.

Licensing—Again

The perennial doubts about the Mac's survival continue because there are so many more DOS and Windows machines. To lessen doubts and gain leverage in the marketplace, Apple must make two major moves to increase its percentage of the market. The first move is to work toward a standard hardware platform, and the second is to license the Mac Operating System. It would have been a mistake for Apple to have licensed the Mac OS in the last few years, because the company was not prepared to live on lower margins and could not have withstood competition from less-expensive Mac clones. In hindsight, Apple's previous opportunity to license was three or four years ago, before Windows had really established itself, and the Mac was still unique. But now that Apple has cut its operating costs, dropped the Mac's prices, and improved the Mac's performance, the company has another opportunity to license the Mac, and it must take the plunge in a big way. Although there are still some compelling financial reasons not to create competition by licensing the Mac OS, the fear of lowered profits should be offset by the opportunity to be a survivor in the market-share wars.



To create a standard hardware platform, Apple needs to work closely with IBM on the PReP specification for PowerPC-based microcomputers, to make sure that complete Macintosh capability can be added to PReP-compliant machines. Sources inside and close to the two companies indicate that these efforts are continuing. Both companies stand to benefit from promoting broad support for a PowerPC-based platform. The result of these two major players' combined efforts in the PC market will be that people will listen and reconsider this alternative to the Intel-based platform. IBM is also more capable of selling into major corporations, which would complement Apple's sales and add key customers to the installed base. On the second point, Apple should also offer IBM an OS license that's attractive enough to overcome any Big Blue reluctance to sell Macintosh OS–based machines to its business customers. Increasing the number of PReP-compliant computers doesn't guarantee that these machines will all be running the Macintosh OS. However, the Mac OS is the only operating system that has a large number of users and mainstream desktop applications and can run on the PowerPC. This gives Apple—and would give IBM—a big advantage.

continues

GLENN MITSUI/STUDIO MD

Apple should also license its OS to one leading PC maker in addition to IBM. Apple doesn't have to license to everyone right away, but sewing up a second license with a firm like Compaq or Dell would greatly affect the perception of the Macintosh architecture and provide access to new customers. Apple will probably have to offer a very attractive deal to this company to convince it to invest in a new market, but Apple should do whatever it takes. Licensing a major clone-maker besides IBM would hold the attention of new customers and developers. The two main dangers are that Apple would lose some sales, and licensing would complicate the evolution of Apple's technology. But Apple would also gain (licensed) sales it would not have otherwise made: it must be willing to lose some hardware sales, in order to grow its market overall. It is now time for Apple to make a bold move and embrace some risk to boost its momentum.

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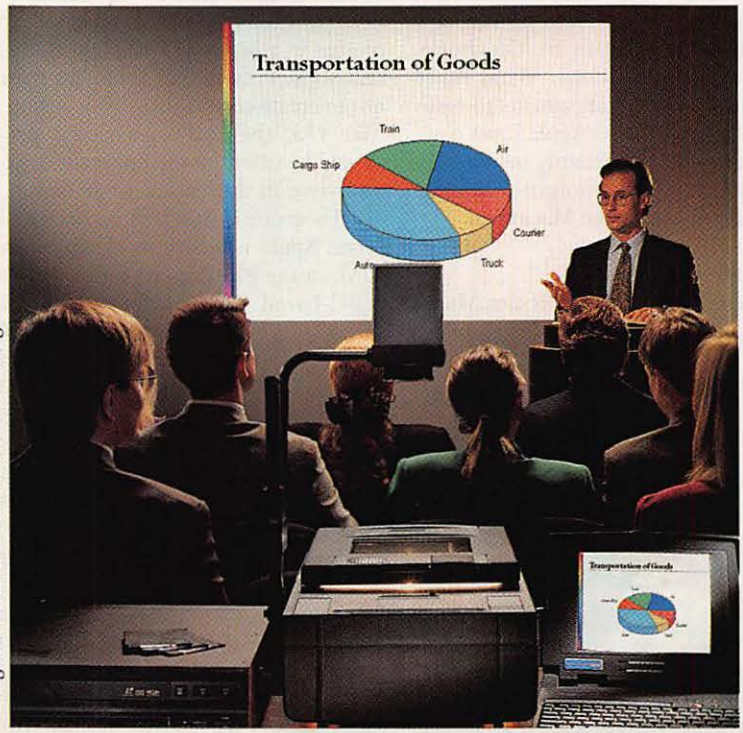


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Circle 117 on reader service card

Innovation

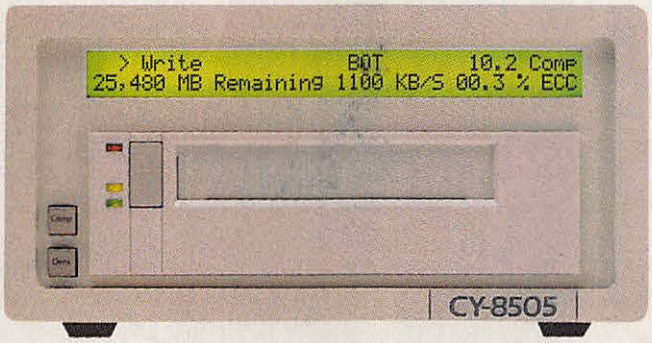
Whatever Apple does, it must maintain the identity of the Macintosh. The Mac has always been unique, special enough that people are willing to go against the tide and buy one. There is tremendous pressure to buy the same system that most other people use. For instance, if you work in a large organization that uses mostly DOS and Windows computers, your MIS manager probably would rather not have to support Macs. As long as Apple owns a significantly smaller share, it needs to differentiate the Mac with unique features. Otherwise users and companies will likely migrate to the most commonly used platform.

The problem is that the Mac is not as obviously different as it once was. People who haven't spent much time with a Mac can't see a big difference between Windows and the Mac (anyone who uses the acronym GUI—pronounced *gooey*—is suspect). With the introduction of the Chicago version of Windows, the distinction between the Mac and Windows interfaces will likely blur even further. You have to spend some time using a Mac to appreciate the difference in quality. Then major differences in usability become apparent. But the difference is no longer evident at a glance, and both share many of the same applications.

Apple must evolve the Mac so that customers can tell at a glance that it is unique. This will require an interface and applications that provide an engaging new dimension. Apple must integrate video and sound into the system so thoroughly that users interact with them as second nature—not simply as novelties or specialized applications. Apple should also design the Mac to be the preeminent platform for communications. People are spending an increasing percentage of their time managing E-mail, faxes, voice mail, online communications, presentations, file transfers, and other forms of communication. If the Mac were clearly better at unifying and simplifying all of this activity it would have a big advantage.

Perhaps most important of all, Apple must convince developers that the Mac offers unique opportunities for success. In the end it will be the creativity and vision of developers that drive the next wave of compelling applications. The developers must have the proper tools and a foundation upon which they can innovate. Instead of spending countless dollars on ancillary businesses such as the Newton, Apple should commit major funds to encourage and support its Macintosh developers. They have always been a key to Apple's success, and they are the likely source of Apple's long-term survival. **m**

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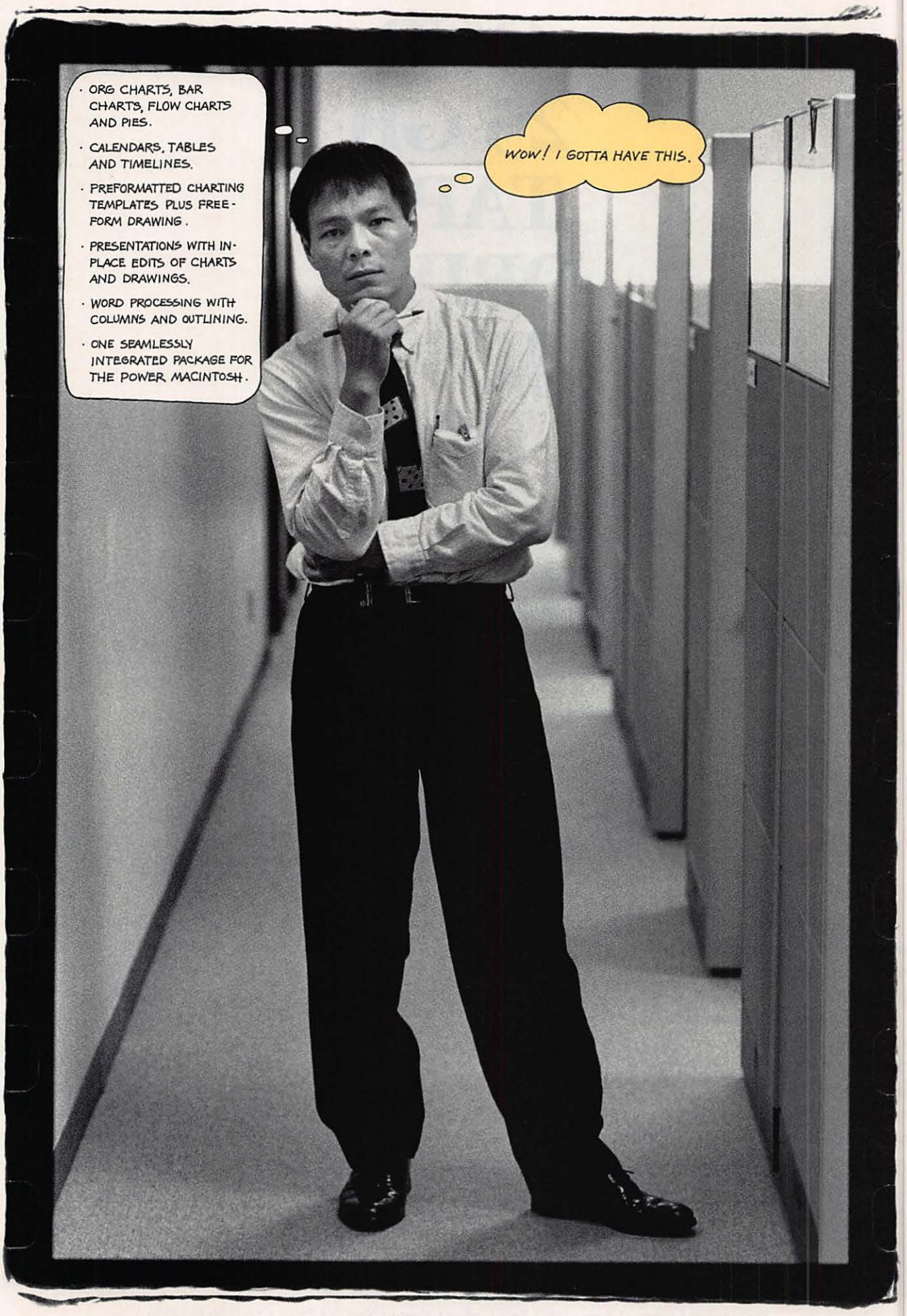
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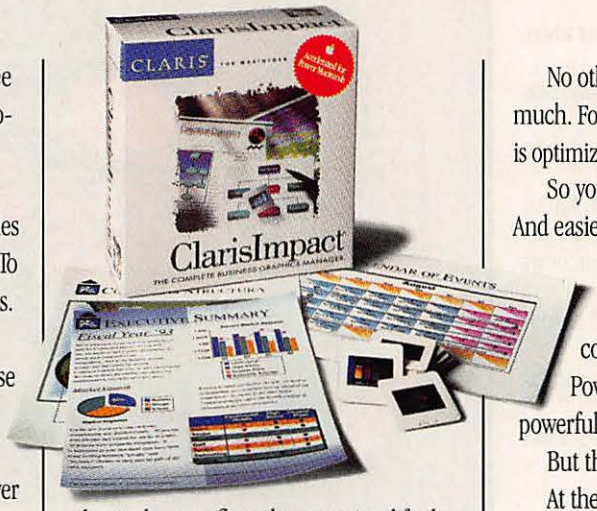
Powered by the new PowerPC chip, Power Macintosh computers run blazingly fast, while providing the expandability, compatibility and AV options you need to embrace the future, today.

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You can even build on-screen presentations, slides, handouts and overheads.

And refine your reports with the integrated, full-featured word processor.

It's one of a kind.

Unlike other business graphics solutions, ClarisImpact is fully integrated. Which means combining text and graphics is a snap. Editing your images is every bit as easy—you never even have to leave the document you're working on.

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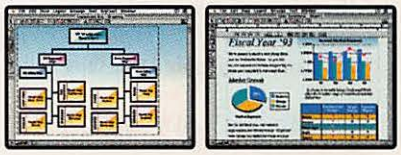
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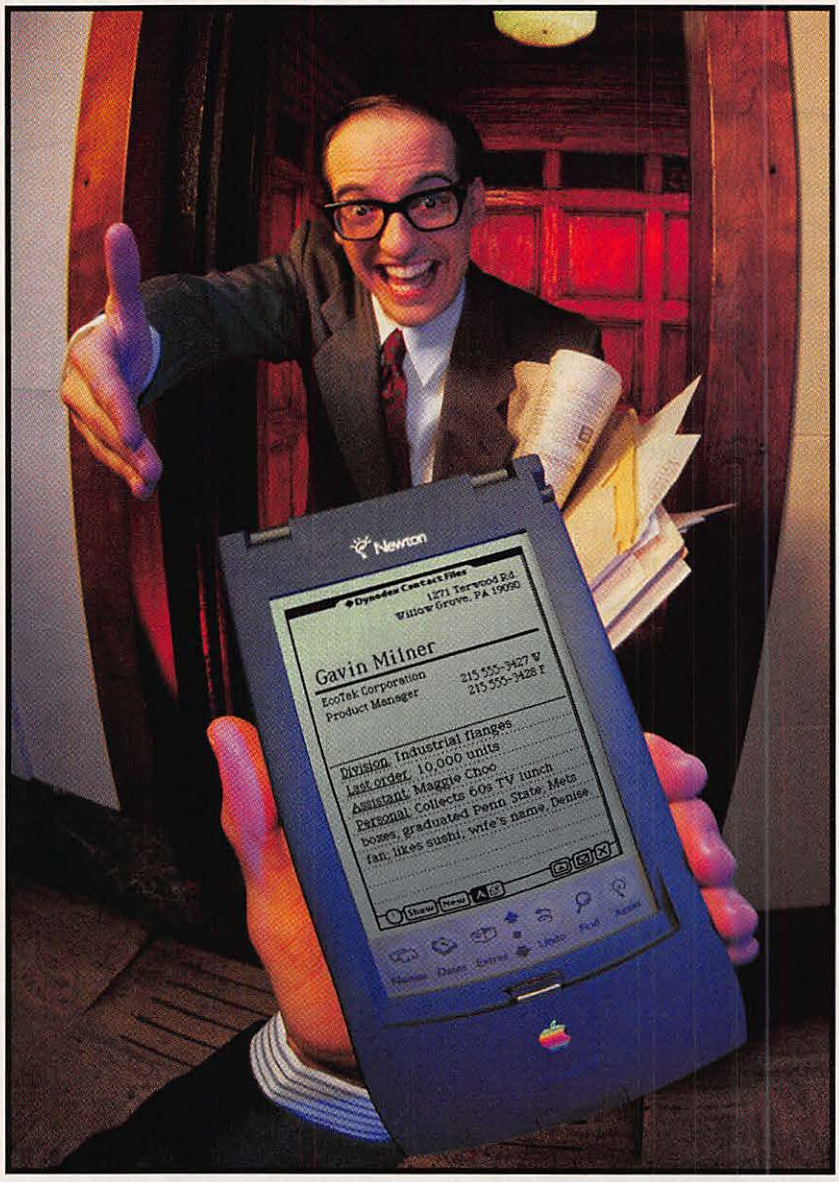
Based on an April 1994 performance study by Ingram Laboratories. †Allow 4-6 weeks for shipping. ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. Power Macintosh is a trademark of Apple Computer, Inc. PowerPC is a trademark of International Business Machines Corporation, used under license therefrom. Claris is a registered trademark and ClarisImpact, "Simply powerful software" and the ClarisImpact design are trademarks of the Claris Corporation.

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So now you can do things like reference sales leads from Dynodex and work with data created in Microsoft Word, all from the palm of your hand. And if you're working on a PC running Windows, the Newton Connection Kit 2.0 for Windows will allow you to easily do the same with all your current Windows applications.**

To find out more, call 800-365-3690, ext. 100, for the Newton dealer near you. Or check out an on-line service for the interactive demo found on the Newton forum.† Either way, you'll find that instead of giving you more technology, Newton gives you something you can really use: help.

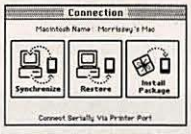


Newton. It's there when you need it.



Newton connects to Windows.
With the Newton Connection Kit for Windows, you can easily exchange information with your Windows-equipped PC.





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*MacLinkPlus Library, a product of DataViz, Inc. **Available summer 1994. ConversionsPlus Library, a product of DataViz, Inc. †Look for the on-line Newton demonstration on the following services: AppleLink; America Online, CompuServe and the Internet. In Canada, call 800-665-2775, ext. 910 for information.* *© 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleLink, AppleTalk, Mac, Macintosh and Newton are registered trademarks of Apple Computer, Inc. The lightbulb logo and MessagePad are trademarks of Apple Computer, Inc. ACT! is a registered trademark of Symantec Corporation. Dynodex is a registered trademark of Portfolio Software, Inc. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Microsoft is a registered trademark of Microsoft Corporation.*

AUGUST 1994

Letters

On Copyright

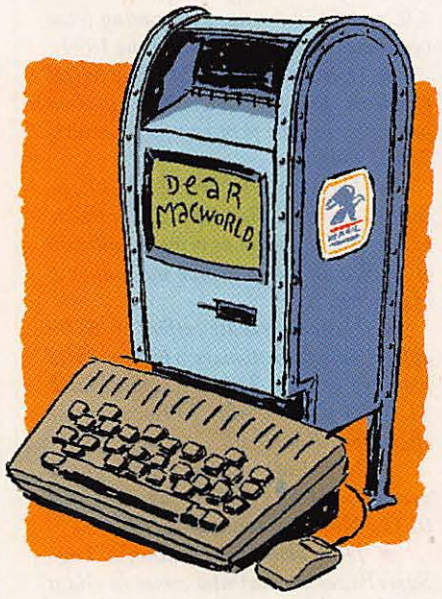
OUCH! A NOTICEABLE OMISSION from the "How to Avoid Copyright Conundrums" sidebar regarding photographic images hurt ("Are You Breaking the Law?," May 1994). If your project required music with vocals, would you sing it yourself because you own a cassette recorder? Would you make up your own typeface because you know how to write letters of the alphabet? Or print a brochure yourself because you have a copier? Yet you advise readers that the next time they need a photograph as a source for an illustration, they should shoot it themselves with a 35mm camera. Casual familiarity with common devices imparts neither technical nor creative proficiency.

How about this helpful suggestion instead: Hire a real photographer! Your copyright usage needs can be a part of the discussion right from the start, and a good professional photographer will deliver professional results.

Peter Billard
Glastonbury, Connecticut

Undoubtedly, there are many situations in which you need the services of a professional photographer. On the other hand, I spoke to several illustrators who have begun taking their own photos of simple objects—a bridge, a park bench, a boat—and incorporating and manipulating those images into larger, computer-generated illustrations. To follow Mr. Billard's line of comparison, hiring a professional photographer, when all you need is a usable image, is like hiring an accountant to fill out the 1040EZ form. —James A. Martin

I FOUND YOUR ARTICLE ON THE USE of copyrighted material (a subject that has mostly been overlooked by the computer media) interesting. You wrote that "depending on how an image from an old magazine is used, the likelihood that someone would recognize the original work and contest its reuse today is probably low." It is very distressing to me to



hear that it is a bad idea to steal someone's work only if you are likely to be caught.

The law is clear: a photographer's work is covered under copyright from the moment the photographer presses the button. Like most photographers, I enjoy seeing my work in print, and therefore my usage prices are usually reasonable. It is certainly not a game to see if you can use someone else's work without getting caught.

Thanks for your article—it's a start.

Ray Hunold
San Francisco, California

I quoted experts who believe it's unlikely that an insignificant portion of an image lifted from an old magazine, then manipulated and collaged into a new illustration, will become the source of a copyright-infringement case. However, I also clearly stated in several places that it's always best to get permission to use someone else's image.—J.A.M.

ALTHOUGH I'M A FIRM BELIEVER IN copyright protection, I would hardly look to the royalties on digital audiotape (DAT) players for "inspiration." The reality is that amateur musicians who use DAT for creating their own music are forced to pay a "royalty" to established performers who already have legitimate avenues for royalty collection (BMI and ASCAP). What will be next? Will the Software Publishers' Association lobby for a disk tax to compensate for possible software piracy?

Greg Scheer
Wilkinsburg, Pennsylvania

PowerPC Bits

READY TO UPGRADE TO POWERPC? Maybe not, depending on the monitor you choose. The on-board video of the Macintosh Quadra/Centris 610 supports monitors up to 21 inches in 8-bit color, and up to 16 inches in 16-bit color; but the Power Mac 6100's on-board video maxes out at 8-bit color on a 16-inch monitor.

If your monitor is larger than 16 inches, you must buy either a NuBus card or a smaller monitor. Sign me: Not Ready to Downgrade.

Gary Van Handel
Houston, Texas

I AM EXTREMELY DISAPPOINTED BY the packaging of the Power Macs. We have a new level of computing power placed inside the same old, boring, and unfashionable case. The PowerBook didn't become one of the most popular portables because it looked like its competitors. Can Apple put a little more effort into the external design of its computers? The benefits we could gain may be well worth the effort.

Kevin McGinty
via America Online

Mistaken Identity

I WAS SHOCKED BY THE COVER OF THE June 1994 issue of *Macworld*. The square and compass, shown as tattoos on the muscular arms in the photograph, is

continues

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CORRECTIONS

- *The June 1994 "Video-Editing Tools" feature incorrectly stated that the Grass Valley Group is owned by Carlton Communications. In fact, Tektronix owns the Grass Valley Group.*
- *The tray-loading CD-ROM drive in the Power Macintosh 6100/60 was introduced in the LC 575, not the Quadra 605* (Reviews, *June 1994*).
- *Version 4.0 of Adobe Premiere costs $79 for users upgrading from version 3.0, and $129 for users upgrading from versions prior to 3.0* (News, *June 1994*).
- *Opcode Systems' OMS fixes MIDI problems for the PowerBook modem port only, not the printer port* (Letters, *June 1994*).
- *The May 1994 article "Does PowerPC Beat Intel's Best CPUs?" incorrectly described a micron as being a millionth of an inch. In fact, a micron is a millionth of a meter.*
- *Nanao's rebate offer of $100 applies only to customers who purchased monitors between January 1 and March 31, 1994* (News, *May 1994*). *Also, the offer expired April 30.*
- *New Video Corporation's phone number is 310/449-7000, fax 310/449-0132* (New Products, *May 1994*).
- *Decathlon Corporation's Logo SuperPower product also comes in Aldus FreeHand format* (New Products, *May 1994*).
- *The Power Macintosh Upgrade Card is not available for the Mac IIvi, IIvx, or Performa 600; instead, owners of those Macs may replace the motherboard with a Power Macintosh 7100/66 or 7100/66AV motherboard* (PowerPC News, *June 1994*).
- *Golden Triangle has not folded, as indicated by a headline in the June 1994* MacBulletin. *As correctly reported in that news item, the company is reorganizing.*
- *The phone number for Now What Software is 415/885-3432* (Reviews, *July 1994*).

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Frederick Randall
Secretary,
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Ancient Free and Accepted Masons
Rantoul, Illinois

The square and compass as pictured on our cover referred only to the drawing functions of the products reviewed and were not intended to imply anything else, either about the software or about Freemasonry. *Macworld* apologizes for any misunderstanding.—Ed.

Math without an FPU?

YOUR PROCESSOR-PERFORMANCE tests are easy to read and easy to understand, and I appreciate them very much, but one thing is not clear to me. In the *News* section of your April issue, Macworld Lab tested the new LC 575, which lacks a floating-point unit. The tests showed very good results in both processor and FPU performance, but how do you test FPU performance in a machine without a coprocessor?

Peter Schmidt
Brookline, Massachusetts

Most (but not all) programs that take advantage of an FPU also have separate code to work on machines without one. Thus, on the LC 575, the floating-point calculations were executed using the alternate code.—Ed.

But Where's the Reset Switch?

REGARDING GUY KAWASAKI'S CORrelation between his firstborn and his Mac: he is right on the money (*Wise Guy*, May 1994). A man might better understand the impact that a new baby will have on his life if he stops to remember the day he bought his first computer.

I struggled through late-night feedings, ear infections, reduced income, and the day-care nightmare; *then* I bought my first Macintosh. What have I learned? Not to take crashes and error messages so seriously!

Laurie Curtis
Somers, Connecticut

Freer Trade

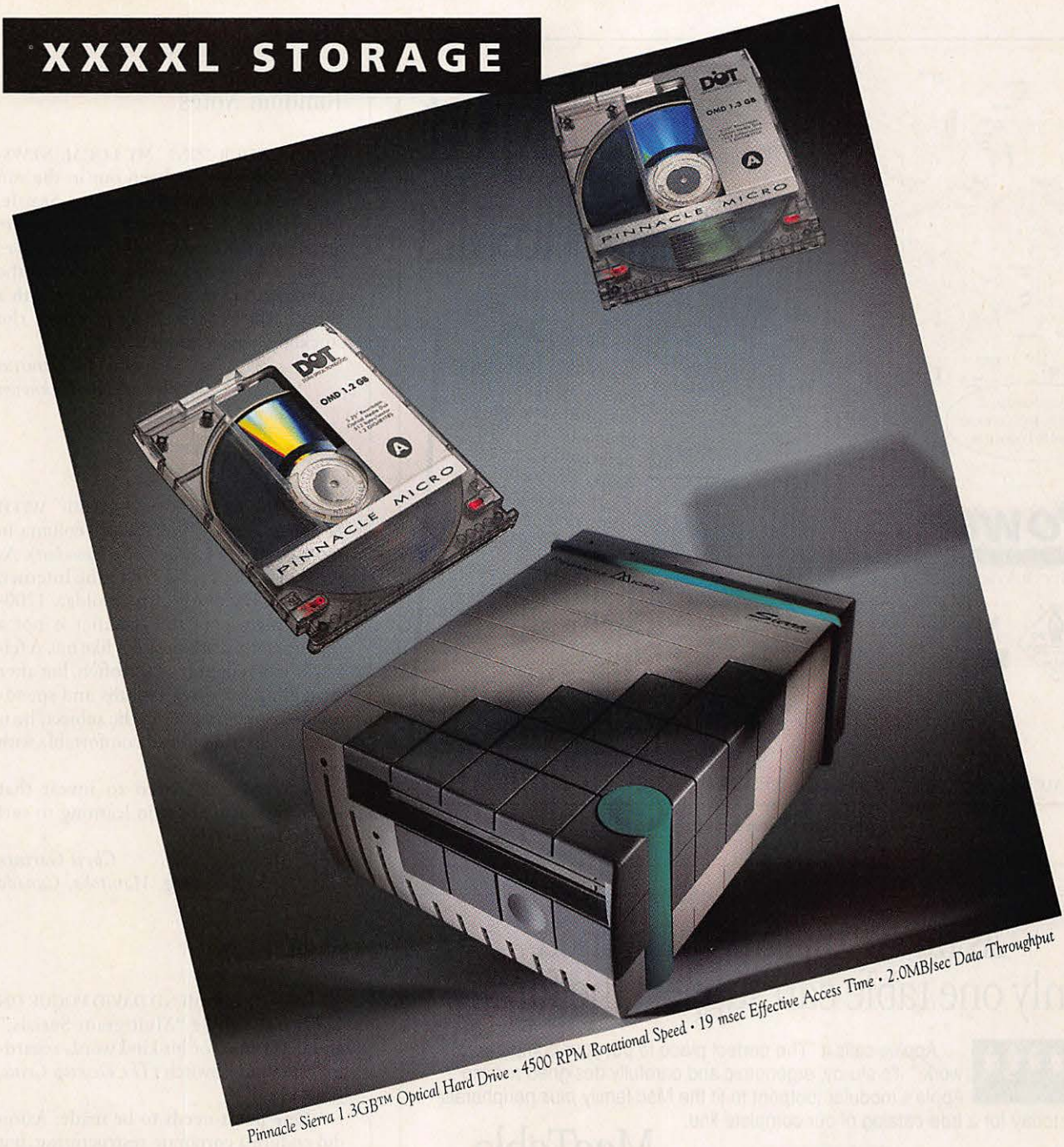
HOLA, AMIGOS! WITH ALL THIS talk about the North American Free Trade Agreement, you'd think the mail-order companies would take advantage of the million-dollar market right next door in Mexico.

In all of the 50-plus computer publications we receive at our university, we found only one international toll-free number—this out of more than 300 direct-sales firms. Computer companies across America, drop us a line. If it's toll-free, all the better.

James Mulford
Mérida, Yucatán, Mexico

continues

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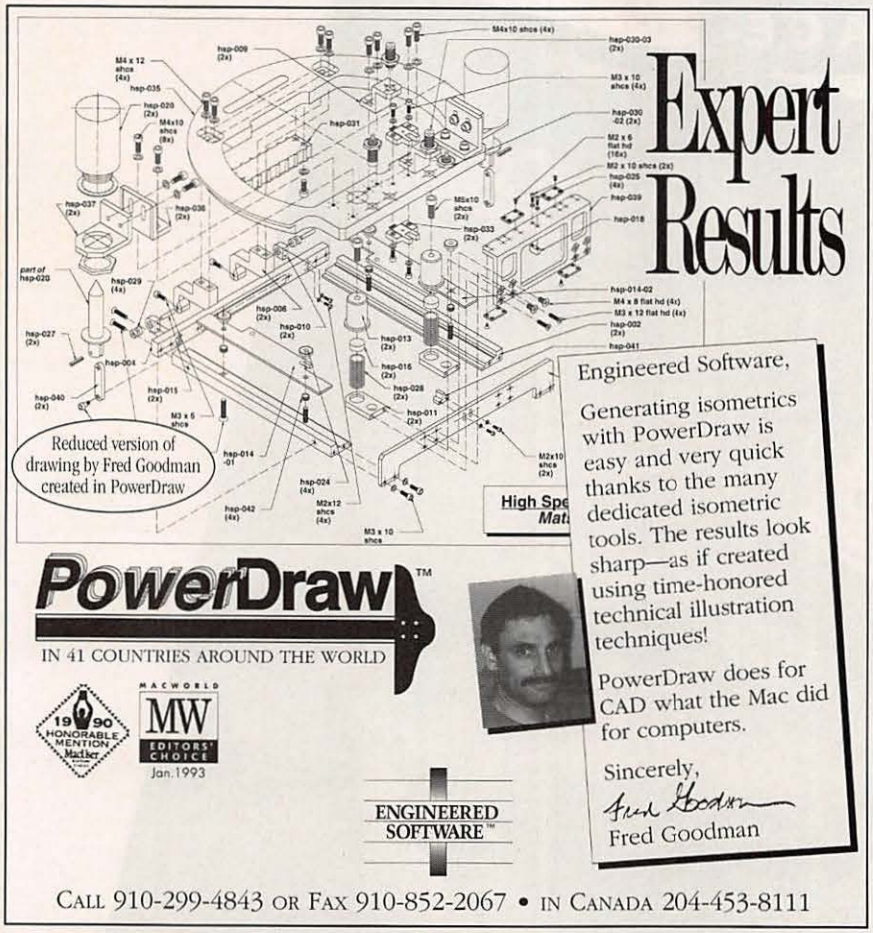
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Circle 12 on reader service card

As far as Apple is concerned, only one table can support the family.

MacUser, June '90

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MacTable design is patent pending.
MacTable is a trademark of Scandinavian Computer Furniture, Inc. Apple is a trademark of Apple Computer, Inc.

Random Notes

I LOVE YOUR 'ZINE. MY LOCAL NEWSstand thinks I've been out in the sun too long, even though I'm from Seattle, where there is no sun. Your magazine arrives on the newsstand's musty shelves during a three- or four-day window at the end of each month, and I'm there with a three-latte buzz, waiting to attack the stockboy like a pack of hyenas.

Nigel Heinsius
Whereabouts Unknown

Net Losses

I COULD NOT AGREE MORE WITH Steven Levy's "Net Gains" column in the March 1994 issue (*The Iconoclast*). As yet, I have not connected to the Internet, primarily because I own an older, 1200-bps modem, and the Internet is not a user-friendly place for folks like me. A fellow worker connects quite often, but after struggling for three months and spending hours reading up on the subject, he is just now starting to feel comfortable with what he is doing.

I am not prepared to invest that much time and effort in learning to surf on the Internet.

Chris Gartner
Winnipeg, Manitoba, Canada

Axion Lives

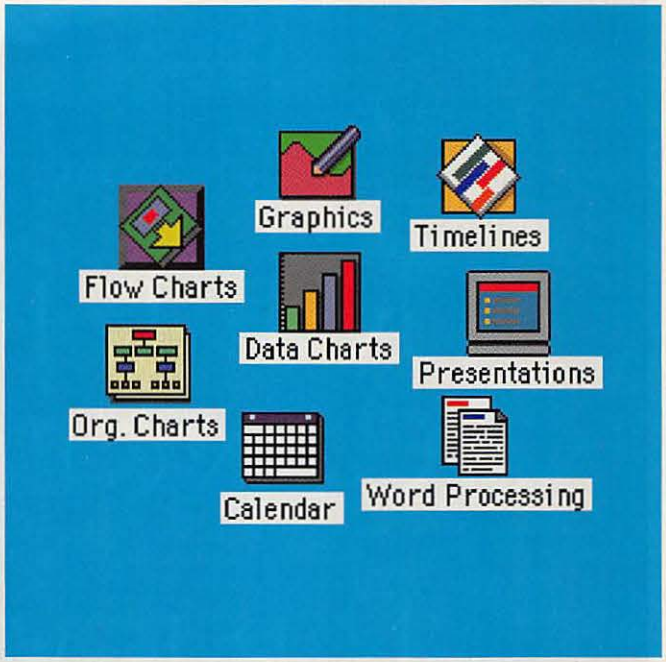
I WISH TO COMMEND DAVID POGUE ON his fine article "Multigrain Serials," and thank him for his kind words regarding the Axion Switch (*The Desktop Critic*, June 1994).

One point needs to be made: Axion did endure a corporate restructuring, but the rumors of its demise were a bit premature. Axion is still here, and it is better than ever!

Larry Woodard
Vice President of Product and Business Development,
Axion
Sunnyvale, California

Letters should be sent to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically, to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1), or via Internet (70370.702@compuserve.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. m





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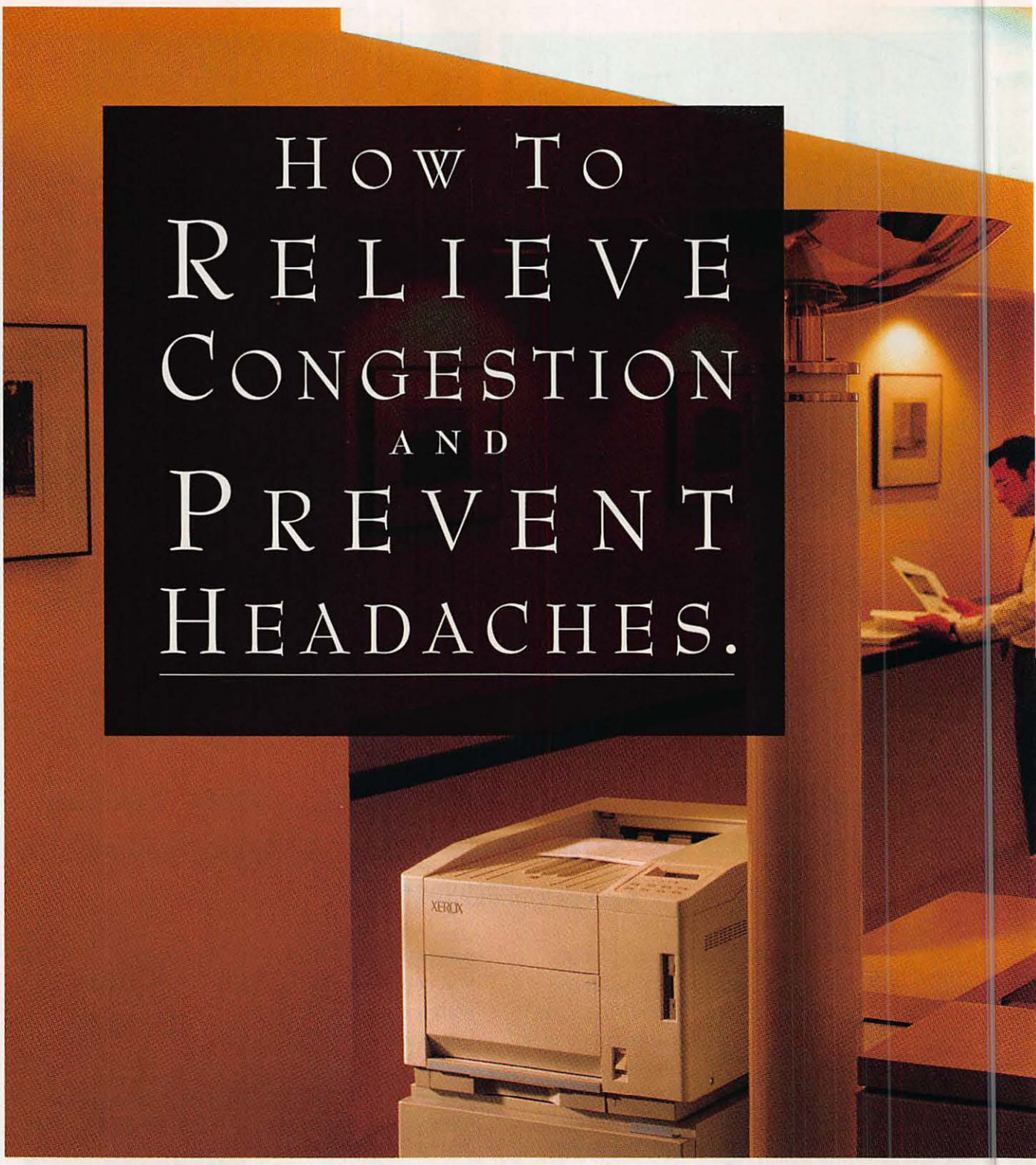
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ClarisImpact was awarded four stars by Macworld magazine and four mice by MacUser magazine in their respective June 1994 issues; it was awarded the Buyers Assurance Seal by InfoWorld magazine in the April 4, 1994 issue. *The regular suggested retail price for ClarisImpact is $399; special introductory price offer good now through September 30, 1994. © 1994 Claris Corporation. All Rights Reserved. Claris is a registered trademark, and ClarisImpact, the ClarisImpact design and Simply powerful software are trademarks of Claris Corporation.



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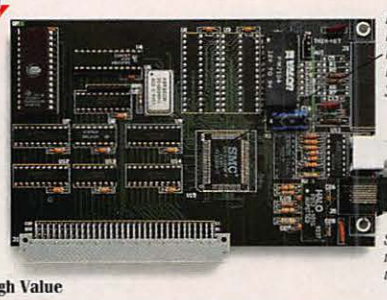
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EtherLAN Hub16
$499.99



Convenience and Value, Times 16

Compare the new EtherLAN Hub16 to other Ethernet hubs – it gives you the best value around, with the features and quality your larger network needs. In one easy-to-use, self-contained unit, the Hub16 provides 16 10BaseT ports and one BNC (thinnet) port. It offers auto-partitioning and auto-reconnect to bring a port back on line quickly once it's clear, and it requires no management software – just connect it and forget it! It installs quickly and easily in offices with an existing 10BaseT wall jack or BNC connection; separate brackets are available for mounting on a standard 19-inch rack.



EtherLAN Print
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COMPARE
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Dayna $419

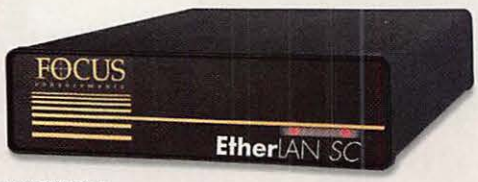
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Easily bridge your LocalTalk LaserWriters to an Ethernet network. It works with any brand of LocalTalk-compatible network printer or other LocalTalk devices such as Macs. With a BNC connector for thinnet and RJ-45 for 10BaseT, you have the ultimate in network flexibility. Includes an easy-to-use security and management utility. For a limited time, get a FOCUS TurboNet to connect your LocalTalk line to the EtherLAN Print. One free with any EtherLAN Print purchase. Choose the EtherLAN Print which supports two printers for $279.99 or the EtherLAN Print Plus which supports up to six LocalTalk devices for $399.99.

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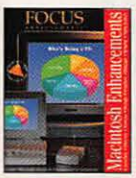
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Circle 201 on reader service card

LATE-BREAKING NEWS

MacBulletin

Apple Drops DOS-Compatible Card After only two and a half months, Apple discontinued its DOS Compatible Card, which put a 25MHZ 486SX-based PC inside a Centris or Quadra 610. At press time Apple said it would also discontinue the preconfigured Mac Quadra 610, DOS Compatible system on June 13.

Apple Cuts Prices Yet Again Apple recently cut the prices of selected peripherals, PowerBooks, and Quadras. The price of the Quadra 660AV 8/230 dropped 20 percent, to $1499; the same version with a CD-ROM drive fell 18 percent, to $1799; and the 8/500 model went down 14 percent, to $2369. The Quadra 950 0/1000 Publishing Configuration was cut 15 percent, to $6229. Price cuts on models of the PowerBook 145B and 165 ranged from 12 percent (down to $1259 for the 145B 4/80) to 27 percent (now $1699 for the PowerBook 165 4/160 with Express Modem). The PowerBook Express Modem Kit was slashed 33 percent, to $215. Apple also reduced the price of the OneScanner by 20 percent, to $699; of the LaserWriter Select 300 by 18 percent, to $600; and of the 14-inch Macintosh Color Display by 21 percent, to $399.

Radius and SuperMac Join Forces Two leaders in the Macintosh graphics and digital-video hardware market have announced their intention to merge. Subject to shareholder and federal approval, Radius and SuperMac will come together in a deal valued at approximately $80.5 million. No changes in operations will occur at either company until October, according to SuperMac. If the merger is still on, at that time the companies will announce their product strategies for implementation.

120MHz PowerPC 601 Chip In a technology demonstration at Apple's recent Worldwide Developers Conference, IBM and Motorola showed a 120MHz version of the PowerPC 601 processor running in a prototype Macintosh. The 120MHz chip is 20 percent faster than the fastest previous 601 chip, a 100MHz model that is available in small quantities but is not yet used in a shipping Power Mac (see *MacBulletin, Macworld,* June 1994). Apple said that the system shown was not guaranteed to be produced but was intended to show developers the capability of the PowerPC chip architecture.

Native Photoshop Does Layers The long-awaited upgrade to Adobe Photoshop, which will support multiple layers, is expected to ship by September of this year. Other new features of 3.0—a native PowerPC release—include CMYK preview, floating customizable palettes, color masks, and additional filters. For $895, you'll get a CD-ROM version as well as the standard floppy-disk set; upgrades are $149. 415/961-4400, 800/833-6687.

QuickMail Goes 3.0 CE Software has announced an August ship date for version 3.0 of QuickMail. The client-only upgrade features rules-based mail management (filtering messages based on preset criteria), multiple-criteria searches of messages (including sender, subject, and body text), and a spelling checker. A ten-user pack retails for $649; current users can upgrade for $12 per client; and users who purchased version 2.6 after June 13 will get the upgrade for free. 515/221-1801, 800/523-7638.

QuickDraw GX Predux By the time you read this, QuickDraw GX, Apple's long-delayed enhanced imaging architecture, should be shipping—but not from Apple. Peirce Software's Peirce Print Tools ($129), a collection of GX printing extensions, also includes GX (which can be installed under System 7.1). Apple plans to ship GX as part of System 7.5 later this year. Peirce, 408/244-6554, 800/828-6554. m

News

EDITED BY TOM MORAN

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Taligent Rising

In 1992, the earth shook: IBM and Apple clasped hands and pronounced themselves allies. From this union sprang Taligent, a small Cupertino, California, company that's now developing nothing less than a universal operating system. When complete, the Taligent OS will be scalable and platform-independent, running on machines based on Intel, PowerPC, and Hewlett-Packard PA-RISC processors. If Taligent is successful, the days of linking an operating system to a particular chip will be over, and the computer industry will again have to adjust to a new way of doing business.



KEVIN IRBY

What's inside a universal operating system? Based on a combination of IBM's Mach 3.0 microkernel and Apple's long-term system-software project code-named Pink, Taligent's operating system is completely object-oriented. Users move through a desktop world populated by People, Places, and Things, manipulating data with tools that are less individual applications than they are extensions of the core system. On a lower level, Taligent's microkernel architecture means that a relatively small chunk of code handles most or all of the interaction with the CPU and other hardware. You can add support for something as simple as a peripheral or as complex as a networking technology just by writing a new system software module. Readers may see similarities to the Mac's system software model of extensions and control panels, but a microkernel architecture is far better-organized, faster, stabler, and, drumroll please, portable.

Developers create programs by adding on to frameworks—software objects that handle basic application services. A graphics framework, for example, would include a generic interface, plus rudimentary drawing and painting tools. A 3-D modeling company could take the graphics framework and add modeling and display algorithms. The theory is that developers, freed from generating the huge amounts of interface code demanded by today's event-driven software, will be

able to concentrate on innovating and improving core technologies. Completed applications will plug into Taligent's Application Framework, which will be entering beta testing as you read this and is expected to be available in the first half of 1995. This first release will run alongside several existing industrial-strength operating systems, including OS/2, AIX (IBM's Unix), HP-UX (Hewlett-Packard's Unix), and eventually PowerOpen (which is based on AIX and will replace Apple's A/UX). Desktop computers will have to wait, though, as Taligent places heavy requirements on an OS, including full 32-bit compatibility, preemptive multitasking, and protected memory. Even for the hardware heavy-hitters, the complete Taligent system architecture won't appear until later in 1995, and after that, migration down to the desktop level will be a lengthy process, because of both hardware and software requirements.

Waiting for Applications

So who's going to write software for this OS wunderkind? Porting software to a new operating system is never easy, and committing to the Taligent OS is an even greater step, as most companies will have to rewrite their applications from the ground up to make them work in Taligent's new order. Taligent, on the other hand, contends that its system software, frameworks, and object-oriented approach will cut development time enough to make the transition worthwhile.

Nevertheless, vendors will be reluctant to adopt Taligent until it's clear that a reasonably large market exists for its products. On HP and IBM Unix machines and on Macintoshes, the Application Framework will act as a stepping-stone to the full Taligent operating system, but at this time no such stepping-stone exists for Intel-based platforms. However tempting it may be to contemplate the drama of an operating system showdown, Taligent officially denies any intent of being a Microsoft killer, and the realities of the market predict a Windows-compatible Application Framework at some point. Otherwise, Windows devotees moving to Taligent would have to make the kind of complete and sudden transition that end users hate. Furthermore, Microsoft would have little incentive to port versions of its own business applications.

One thing that will smooth the road to Taligent is OpenDoc, Apple's cross-platform vision for component software. OpenDoc will get developers used to writing reusable and self-sufficient software objects, while it gets users adjusted to a more document-centered, task-oriented work environment. Also, because Taligent is a founding member of CILabs, the independent company that's monitoring OpenDoc compatibility, OpenDoc developers can be reasonably certain that this path to Taligent won't drop out from under their feet.

Will Taligent succeed? The Apple-IBM partnership appears to be batting one-for-one with the success of PowerPC, and as bizarre as it sounds, the future of the relationship looks good. The recent addition of Hewlett-Packard as an investor in the company also augurs well for Taligent's prospects, especially since one of the keys to Taligent's success will be its adoption by large corporate buyers for use on their enterprise systems.

What does Taligent mean to current Mac owners if it does succeed? Probably not much for about two years. Apple's current thinking is to (1) ship Taligent's Application Framework on top of PowerOpen in 1995, (2) ship a full system with Taligent running native on Apple hardware with initial sales to enterprise clients, and (3) evolve the Mac OS to the point where it can handle the Taligent Application Framework—currently expected to be sometime in 1996, with the project currently code-named Gershwin (see "Apple Tells Its Software Future" in *News*, *Macworld*, June 1994), although a tricked-out Chicago (Microsoft's next-generation Windows OS) could force Apple's hand. The tip sheet says don't look for People, Places, or Things on your desktop anytime soon. But in the long run, for both Apple and end users alike, Taligent's vision of an object-oriented, cross-platform OS might be too tempting to pass up.

—CAMERON CROTTY



SCOTT PETERSON

Epson's Color Stylus ink-jet printer uses special paper to achieve true 720-dpi resolution.

Hi-Res Color Ink-Jet

EPSON JOINS THE FRAY

While Hewlett-Packard and Apple have been going after color ink-jet SOHO customers hammer and tongs (see "Battle over Color Printers," *News*, May 1994), Epson America hasn't been sitting still. In fact, the company has just announced its entry into the market: the Color Stylus, a color ink-jet printer that can print at 720-dpi true resolution. Of course, in order to achieve this resolution, you need special paper, which Epson sells for $24 for 200 sheets, more than ten

continues

In Brief

SuperMac Adds II Spigot

Spigot II Tape is the latest in SuperMac's VideoSpigot digital-video hardware line. The full-size NuBus card encompasses the functions of the original VideoSpigot and adds a composite-video-out port, support for recording to tape, and additional minor improvements. Spigot II Tape ships with SuperMac's ScreenPlay II software and lists for $999. 408/541-6100, 800/334-3005.

CoSA Revives Hitchcock

CoSA, a division of Aldus, recently began shipping the resurrected Hitchcock, an application for professional nonlinear video editing. Hitchcock supports 60-fields-per-second video at 640-by-480-pixel resolution using JPEG compression. It also includes stereo audio, produces edit-decision lists, and exports files as QuickTime movies. It is designed to work with the most common Macintosh JPEG video-digitizing boards. 206/343-4208.

Catalog for People with Disabilities

Apple's new mail-order service, called Aisle 17, offers assistive technology products to adults and children with disabilities. Among the products will be Macintoshes bundled with various devices, such as the Co:Writer writing assistant. Aisle 17 is open 24 hours a day, seven days a week, but is available only in the United States for now. 800/600-7808, for TTY devices 800/755-0601.

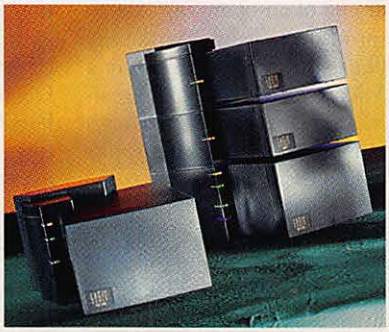
Lotus Drops the Mac

After a long history of futility in developing for the Macintosh (Jazz, for example), Lotus has announced it will do no new development for the Mac Operating System, with the exception of communications products including Notes and cc:Mail. 617/577-8500, 800/343-5414.

times the cost of ordinary printer bond. Users can proof their images at 360 dpi and use the 720-dpi resolution for final output.

Using Epson's proprietary piezoelectric ink-jet technology, the Color Stylus in standard mode prints at 360 dpi on any kind of paper. The base model is a serial QuickDraw printer, and although Epson sells a LocalTalk upgrade card, the company currently has no plans for an Ethernet upgrade. Similarly, Epson expects to update the driver and add a ColorSync model when QuickDraw GX appears but has no plans for PostScript emulation.

Print times for the Macintosh model were not available at press time, as the driver software was incomplete, but Epson claims that at 360 dpi, the Windows configuration of the Color Stylus is twice as fast as comparable printers, and slightly faster even at 720 dpi. Whether or not this speed makes it to the Mac remains to be seen. The printer uses two ink cartridges: one containing black ink and the other containing the cyan, magenta, and yellow inks. You'll be able to replace the black ink cartridge separately when it runs out—replacement costs were not available at press time. The Color Stylus handles up to legal-size paper and ink-jet transparencies, although you can print only at 360 dpi on transparencies. The Color Stylus is expected to ship this fall for $549 (street price). Epson America, 310/782-0770, 800/922-8911. —CAMERON CROTTY



SCOTT PETERSON

La Cie offers many types of drives in different capacities for its Joule Modular Storage System.

Stackable Storage

MODULAR DRIVES AT NO PREMIUM

La Cie has designed the Joule Modular Storage System, a series of stackable storage modules including hard drives, tape drives, SyQuest removable-cartridge drives, and optical drives. Up to seven of the SCSI devices can be stacked, mixed, and matched. La Cie will offer Joule drives in different sizes—full-height, half-height, and 2½ inch—each with the hardware to fit it into the Joule system, and for about the same price as an ordinary storage device of the same capacity.

Each Joule system starts with a base unit that includes one storage device; a 100-watt universal power supply; and a top cap, which covers the connectors in the top drive of the stack and includes the single SCSI cable that connects to the Macintosh. Another feature of the Joule system is portability: any drive except the base can be plugged into or pulled out of the stack (by sliding it in or out) without breaking the SCSI chain, although the system must be turned off.

A typical base unit with a 340MB hard drive lists for $389. Hard drive module prices start at $259 for a 170MB version and top out at $2339 for a 2GB device. Other available base units are a $539, 105MB SyQuest drive and a $689, 270MB SyQuest drive; both SyQuests are also available as modules. Other modules include 5GB and 8GB DAT drives, 155MB and 600MB tape drives, and optical drives in either 128MB or 230MB versions—all modules and base units are currently shipping. La Cie, 503/520-9000, 800/999-0143.—T.M.

BUGS & TURKEYS

Apple changed the EtherTalk protocol for its LaserWriter Pro 630 and IIg. As a result, equipping one of these printers with a Farallon EtherWave transceiver slows print jobs to a crawl. Users hit by this slowdown can either use a non-EtherWave transceiver on their 10BaseT chain leading to the 630 or IIg, or contact Farallon for a free hardware device that, when placed between the printer and transceiver, fixes the problem.

The MacPro Plus keyboard from Key Tronic won't work if you've got a trackball connected to it. The problem shows up as soon as you restart your Mac. Key Tronic hopes to have a fix available soon.

The LC 575's new Energy Saver control panel is supposed to allow users to specify a period of inactivity after which their monitor shuts off. However, restarting the Mac returns the control panel to its default setting of 60 minutes before shutdown. Apple said it hopes to fix the problem soon.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld.*

MultiSync 2V Monitor

LOW-COST COLOR

Designed mainly for the home- and small-office markets, NEC's MultiSync 2V is a 14-inch color monitor that shows up to 1024 pixels by 768 pixels and has an estimated selling price of $355. The display has a 0.28mm dot pitch, and its automatic digital controls adjust the size of the active viewing area and its centering.

The MultiSync 2V complies with the EPA's Energy Star power-saving guidelines and with the MPR II guidelines for emission of electromagnetic fields. Slated to ship on June 13, the 2V will come with a three-year warranty. NEC, 708/860-9500.—T.M.



KEVIN CANDLAND/SCREEN IMAGE—TONY STONE IMAGES

The 14-inch NEC MultiSync 2V display should sell on the street for about $355.

Big Arrays

MICRONET EXPANDS RAVEN LINE

For those who desire to frolic in a firehose of data, MicroNet has announced several high-speed, high-capacity drive options. The top of that company's Raven line now includes a 17.3GB dual-drive, SCSI-2 Fast, RAID Level 0 array that comes in two flavors: one for the Quadra 900 and 950 and Power Macintosh 8100, and one for the Quadra 650, 800, and 840AV. The difference between the two pack-

ages is that the former connects to the built-in SCSI ports of the Quadra 900 and 950 and Power Mac 8100, while the latter ships with the company's NuPort III card, which plugs into a NuBus slot and provides an extra SCSI port. The Raven 17.3GB array uses two 5.25-inch, 9GB Seagate drive mechanisms (see "Big Drives," *News*, in this issue), and features an average access time of 6.3ms. When connected to a Quadra 900 or 950 or a Power Mac 8100, the new Raven can sustain a data-transfer rate of 7.2 MBps, but it tops out at 6.8 MBps when connected to a Quadra 650, 800, or 840AV. The array alone will retail for $15,980; with the NuPort III card, the price jumps to $16,280. In related news, Storage Dimensions has also announced a 17GB array based on the new Seagate mechanisms that is expected to ship in June. Its price was not set at press time.



PAUL BERG

The MicroNet Raven 17.3GB array comes in two boxes, each with a 9GB Seagate drive mechanism.

The Raven Shuttle places two removable 3.5-inch Seagate hard drive mechanisms in a SCSI-2 Fast array, combining speed and transportability. Users can get up to 4GB with an average access time of 6.3ms and a sustained data-transfer rate of 8 MBps. Prices will range from $3995 to $7595, depending on capacity.

MicroNet has also announced a Macintosh version of its RAIDbank SCSI-2 Fast disk array system for the Quadra 650, 800, 900, 950, and 840AV. The new RAIDbank can now support six drives for up to 12GB of storage with an average access time of 8ms to 11ms and a sustained data-transfer rate of 7.2 MBps. The RAIDbank supports RAID Levels 0, 1, and 5, and will ship in July for $3995 for a desktop model, $3895 for a rack-mount model, and $4095 for a tower-case model. MicroNet, 714/453-6000, 800/800-3475; Storage Dimensions, 408/954-0710.—CAMERON CROTTY

THE AMCOEX INDEX OF USED MAC PRICES

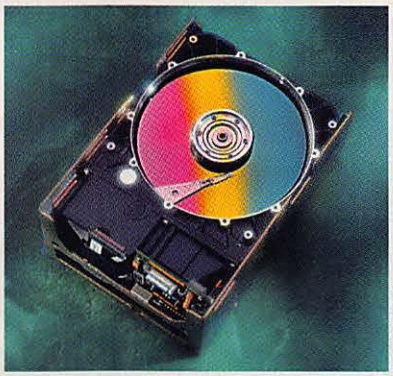
Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$675	–$25
PowerBook 140/4MB/40MB	$950	–$50
PowerBook 180/4MB/80MB	$1750	–$50
PowerBook Duo 230/4MB/80MB	$1100	$0
Mac Classic/2MB/40MB	$400	–$25
Mac SE/30/2MB/40MB	$650	+$50
Mac LC II/4MB/40MB	$550	+$50
Mac IIsi/3MB/40MB	$575	–$25
Mac IIci/4MB/80MB	$925	+$25
Mac IIfx/4MB/80MB	$1050	–$50
Centris 650/8MB/230MB	$1175	–$25
Quadra 900/8MB/160MB	$2275	–$25

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during the week of May 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

Big Drives

4GB AND 9GB SEAGATE MECHANISMS

Seagate has announced two SCSI-2 Fast hard drive mechanisms: the 3.5-inch, half-height, 4GB Barracuda, and the 5.25-inch, 9GB Elite. The new Barracuda features a 12ms average access time and a sustained data-transfer rate of 6.5MB per second. Several companies have said they are considering the 4GB Barracuda for their external drive product, but only a few, including Procom, APS, and ClubMac, have set pricing. Procom's retail price for the MD4303 is $6249, and APS's price is $3799; ClubMac will sell its external drive for $3599. Drives based on the Barracuda 4GB mechanism will be available in quantity in July or August.



ROBERT PERRY

The Elite from Seagate is a 5¼-inch SCSI-2 Fast hard drive with 9GB capacity.

The 9GB Elite will be available in June, and more companies have committed to selling the drive, at prices ranging from $5000 to $8000. Look for drives from Procom, APS, Storage Dimensions, MicroNet, FWB, Focus, and ClubMac, among others. Micropolis is racing Seagate to market with its own 9GB mechanism that has an average access time of 12ms and a sustained data-transfer rate of 4.3 MBps to 6.5 MBps. Micropolis expects to sell internal versions for between $5200 and $5500; external versions will run between $6240 and $6600.—CAMERON CROTTY

In Brief

Mac Tracks FedEx

Got a Federal Express account number, a System 7 Mac, and a modem? Then you can use FedEx's Tracking Software to find out what your packages are doing, day or night. Once you type in a package's tracking number, you can follow your item's journey from pickup to delivery and find out when, where, and to whom it was delivered. Getting an account number is free, the software is free, and using the software is free, as Federal Express has set up an 800 number for Tracking Software calls. Federal Express, 800/238-5355, international 800/247-4747.

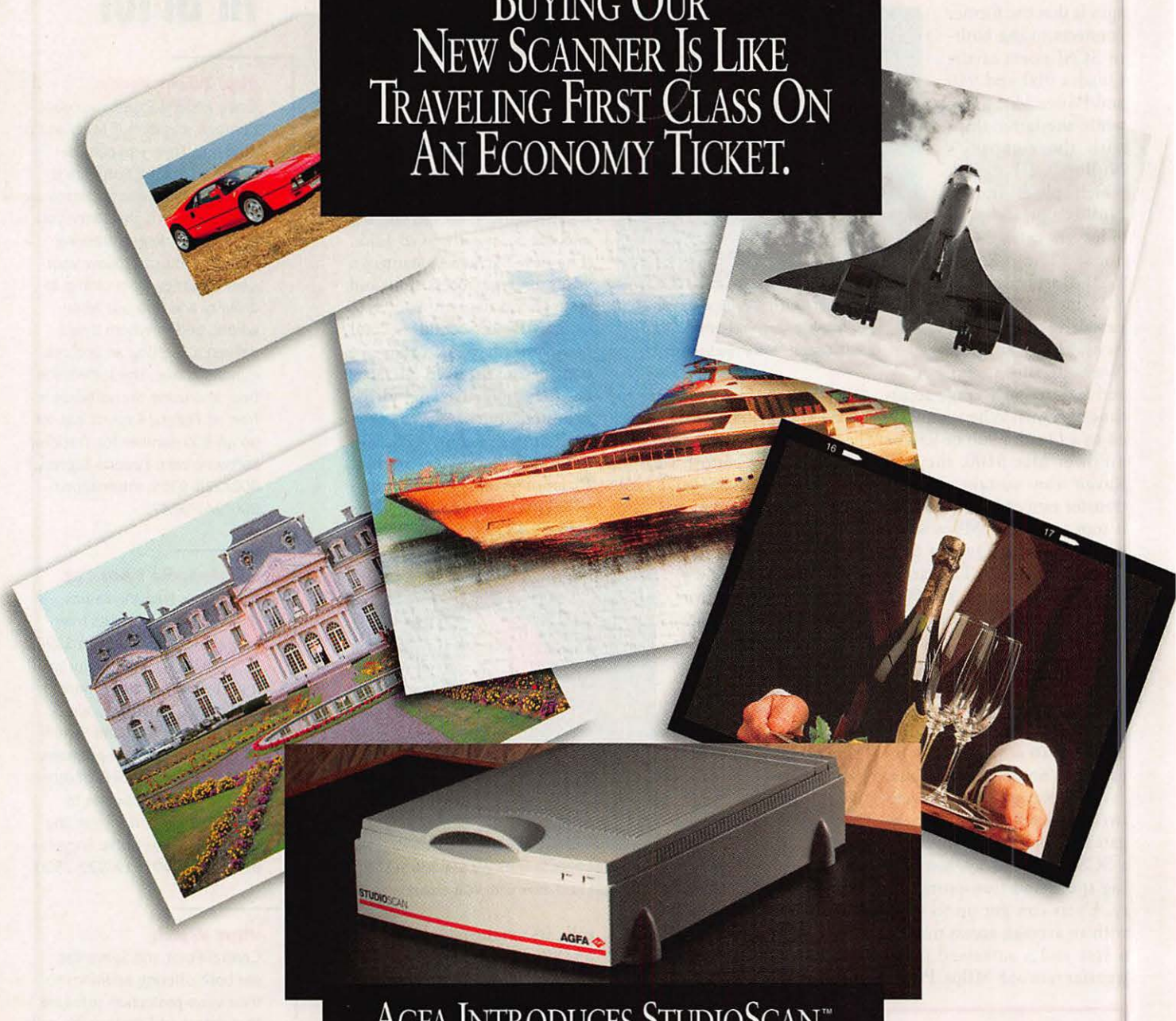
Encyclopedia Price Cut

Compton's NewMedia has reduced the price of its Interactive Encyclopedia from $395 to $149.95. The company said it is "testing" the new price. Compton's NewMedia also ended its Upgrade and Switch competitive upgrade program, which allowed owners of other electronic encyclopedias to trade them in and receive the Compton's Interactive Encyclopedia for $149. 619/929-2500.

Virus Watch

Central Point and Symantec are both offering additions to their virus-protection software that detect and destroy the new INIT 29-B virus, which is capable of affecting all Macintoshes. Users of Symantec AntiVirus for Macintosh (SAM) 3.5 can upload the new virus definition into SAM Virus Clinic from the Symantec bulletin board (503/484-6699 for 2400 bps, 503/484-6669 for 9600 bps) or from CompuServe, America Online, or AppleLink. For a $12 version on disk, call 503/334-6054 or 800/441-7234. Users of Central Point Anti-Virus for the Macintosh can get the update from the company's BBS (503/690-6650 for 2400 bps, 503/690-4777 for 9600 bps) or from the same online services or the Internet.

Buying Our New Scanner Is Like Traveling First Class On An Economy Ticket.



Agfa Introduces StudioScan.™ So Much Scanner For So Little Money.

It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

StudioScan offers the speed and efficiency of one-pass scanning for both black-and-white and color images. Its flatbed design accommodates sizes up to 8.5″ x 14″, and an optional transparency module scans 35mm slides up to 8″ x 10″.

What's more, StudioScan comes with a complete software package, including Agfa's proven labor-saving FotoLook,™ FotoTune LE,™ FotoSnap™ programs, and Adobe PhotoShop LE. Compatible with both Macintosh and PC systems, StudioScan actually guides an entry-level user through the entire scanning process.

To find out more about StudioScan's high-quality imaging for your layouts, in-house publications, illustrated reports, and more, call 1-800-685-4271 today. And discover the Agfa scanner that offers first-class features at an economy price.

AGFA

The complete picture.

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Circle 158 on reader service card

Power Mac News

Did Vendors Deliver?

MOST PRODUCTS SHIPPED AS PROMISED

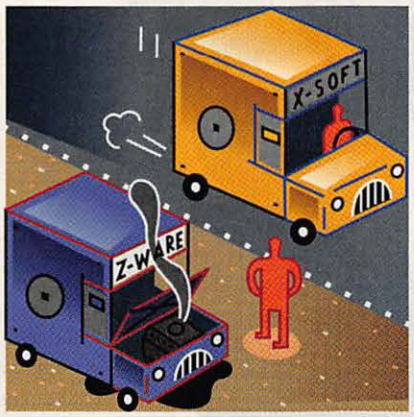
With the introduction of the Power Macs in March, Apple and third-party developers promised a wide array of native software options and hardware upgrades. Now that the dust has settled, were the promises hype or reality?

Upgrades Historically, in the mad dash for more, better, and faster, Macintosh owners wanting the latest upgrade often stumbled because the Apple-produced upgrades simply weren't available in sufficient quantity. Apple seems to have reversed that trend with its PowerPC upgrade cards and motherboard replacements for Centris and Quadra Macs.

An informal survey of Apple-authorized resellers across the country shows that most carry both the PDS upgrade card and the motherboard replacement (we asked about the 6100/60 upgrade). Some dealers, especially in rural areas, special-order the items as they're requested and were quoting waits of one day to two weeks.

Native software In February, 27 vendors claimed they would have native versions available within 30 days after the March 14 Power Mac introduction (see "Power Mac Software," *Macworld*, May 1994). But almost a third of them had still not shipped as of June 1.

Among the tardy is none other than Apple Computer, which promised that a native



DOUG ROSS

version of PhotoFlash 1.1 would be available at the time of the Power Mac introduction. Other notably tardy products include Macromedia's MacroModel 1.5, Nisus Software's Writer 4.0, National Instruments' HiQ 2.1, Gryphon Software's Morph 2.5, and Dayna Communications' ProFiles 1.0.

One company delivered early: Aldus shipped FreeHand 4.0 a month before it had promised to do so.

—SUZANNE COURTEAU AND MATTHEW HAWN

Prices Beat Some PCs

6100 IS CHEAPER THAN 60MHZ PENTIUM PCS

Apple has mostly delivered on its promise to sell Macs at similar prices to equivalent Windows PCs. Despite a steep drop in the prices of Pentium-based PCs, a *Macworld* survey of prices shows that, on average, a Power Mac 6100/60 system costs about $300 less than an equivalent 60MHz Pentium PC. But the Power Macintosh 8100/80 costs about $1300 more than an equivalent 90MHz Pentium PC. The average price for a 7100/66 system runs about $200 more than for a 66MHz Pentium PC.

The table "Prices: Power Macs versus Pentium PCs" shows our survey results. Keep in mind that prices do vary by type and location of sales outlet. Our prices reflect what you'll find in major metropolitan areas.

To make sure we were comparing similar systems, we added the costs of missing components, such as the keyboard and monitor for the Power Macs (about $600) and the network and sound cards for the PCs (about $250). For the high end, we compared prices of systems equipped with double-speed CD-ROM drives, 500MB hard drives, and 16MB of system RAM.

We also compared prices of midrange systems (8MB of RAM, a 240MB hard drive, no CD-ROM drive, and no sound card).—GALEN GRUMAN

Power Watch

THE LATEST PRODUCTS FOR THE POWER MACS

Artifice offers DesignWorkshop, an $895 3-D CAD package. Upgrades from the 680X0 version cost $49. 503/345-7421.

- Connectix's $99 RAM Doubler 1.5 should be available by July in fat-binary format; upgrades from the 680X0 version 1.0 will be free, from online services. 415/571-5100.
- Data Description has released a fat-binary version of its $595 Data Desk 4.2 data analyzer; upgrades from version 4.0 or 4.1 for 680X0 Macs cost $45. SAS Institute says its $695 JMP data analyzer will be available by September, with a $50 upgrade price. Data Description, 607/257-1000; SAS, 919/677-8000.
- TechWorks offers a $295, 256K cache card for the Power Mac 6100 and 7100. 512/794-8533.

Look to the other news sections each issue for Power Mac announcements related to graphics, business, and network users.—GALEN GRUMAN

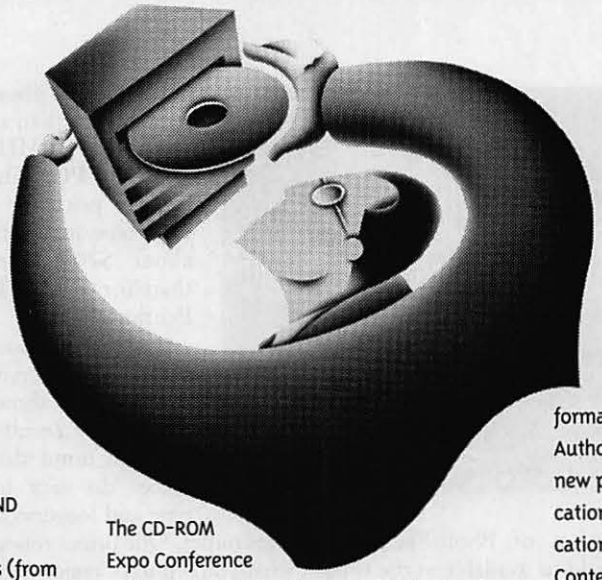
Prices: Power Macs versus Pentium PCs

	Midrange System	High-End System
Power Mac 8100/80 (dealer)	**$4400**	**$5500**
90MHz Pentium PC (dealer)	$3300 (–$1100)	$4100 (–$1400)
90MHz Pentium PC (mail-order)	$3200 (–$1200)	$4000 (–$1500)
Power Mac 7100/66 (dealer)	**$3300**	**$4400**
66MHz Pentium PC (dealer)	$3000 (–$300)	$4800 (+$400)
66MHz Pentium PC (mail-order)	$2900 (–$400)	$3800 (–$600)
Power Mac 6100/60 (dealer)	**$2500**	**$3600**
60MHz Pentium PC (dealer)	$3200 (+$700)	$4200 (+$600)
60MHz Pentium PC (mail-order)	$2700 (+$200)	$3200 (–$400)

Prices in parentheses show difference compared with the equivalent Power Mac. Prices are based on an informal survey; see text for system configurations.

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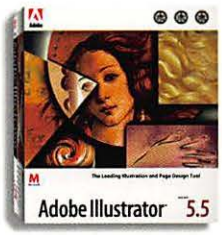
Here's what's going on in our head. Pencil sketch is scanned into Adobe Illustrator. Rainbow color effect ❶ is created with Linear Gradient. Scanned eye ❷ is colorized in Photoshop to simulate a sunglass effect. Grid of green & black in the other lens ❸ is altered with Twirl filter. Circles are added to the bottom of the letter "A" ❹, Pathfinder filter unites them. Letter is imported into Adobe Dimensions™ which adds perspective. Brush stroke ❺ is created with the Calligraphy tool and then painted with multi-color Gradient. The spreadsheet chart ❻ is converted into an Acrobat PDF file and imported. Light bulb glow ❼ is achieved with Shape Blending tool. Punk filter creates spikes ❽ on globe. Entire ad was created and spell checked using Adobe Illustrator 5.5.

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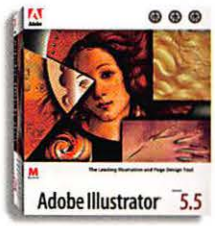
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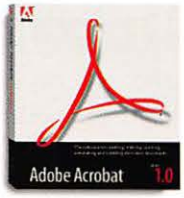
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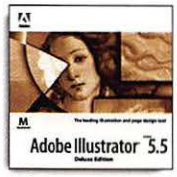
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New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

APS T 520

This hard drive fits in any PowerBook or Duo and provides just over 500MB of formatted storage. The APS T 520 features an average access time of 26ms and comes bundled with the company's PowerTools hard drive utility software. Dantz Development's DiskFit Direct backup software is also included. One version of the drive comes in an external enclosure with a rechargeable battery that lasts up to four hours. Internal $899; external (Companion II enclosure) $989; AC/DC portable with battery $1039; configured for LaserWriter Pro 630 $949. APS Technologies, 816/483-6100, 800/235-2752; fax 816/483-3077.



APS T 520

ATS Power House

When there just isn't enough room in your Macintosh's case for all the cool stuff you want to add, step up to an enclosure like this one. The Power House is constructed of anodized aluminum; sits on four casters; and features a 450-watt power supply, ten drive bays, an audio speaker, an extra fan, and an LED indicator panel to show SCSI and floppy drive activity. The case can accommodate the guts of a Quadra 900 or 950, or a Mac II, IIx, or IIfx. $1200. ATS, 404/455-6225; fax 404/455-9803.

ClearVueColor 17 and 20T

The first of these two multiresolution color monitors is a 17-inch display that features a 0.26mm dot pitch and support for resolutions from 640 by 480 pixels to 1024 by 768 pixels at 50Hz to 100Hz. The second is a 20-inch Trinitron display that features a 0.31mm aperture pitch and supports resolutions up to 1280 by 1024 pixels at 50Hz to 160Hz. Both monitors have digital controls and can remember up to 22 different settings. The monitors are also MPR II–compliant. 17, $1049; 20T, $2149. RasterOps, 408/562-4200, 800/729-2656; fax 408/562-4033.



ClearVueColor 20T

CryptoCom V.32bis

When you put one of these modems on either end of the line, all that would-be eavesdroppers can hear is DES-encrypted data. The CryptoCom V.32bis is a standard 14.4-Kbps data modem that supports all the standard error-correction and data-compression protocols, including MNP Class 10 for cellular communications. Additionally, if two CryptoComs are talking to each other, they will encrypt their transmissions. $895. Western DataCom, 216/835-1510, 800/262-3311; fax 216/835-9146.

DEClaser 5100

This 600-by-600-dpi laser printer comes with 2MB of RAM (expandable to 66MB); it features simultaneously active AppleTalk, serial, and parallel ports, with active emulation switching. The printer supports PostScript Level 2 and HP PCL 5E. Several upgrade options are available, including a 1200-dpi-resolution board; a 128MB hard drive; and interface cards for connecting to Token Ring and Ethernet networks supporting EtherTalk, NetWare, LAT, or TCP/IP. $2199; 1200-dpi upgrade (requires 10MB of printer memory) $299; 128MB internal hard drive $499; Multi-Protocol Ethernet Network Card $499; Multi-Protocol Token Ring Network Card $599. Digital Equipment Corp., 508/493-5111, 800/777-4343; fax 508/493-8780.



DEClaser 5100

DGR Max

If your house were too small, you'd move into a larger one, so why not do the same for your Mac? This expansion chassis for Mac LC, LC II, LC III, and Performa computers provides four PDS slots, a 40-watt power supply, and an additional bay for a larger hard drive (up to a half-height 3.5-inch drive mechanism). The Multi Max includes all this but puts an internal, tray-loading, double-speed, multisession Photo CD CD-ROM drive in the bay. The Multi Max also adds two internal amplified speakers. $299; Multi Max $799. DGR Technologies, 512/476-9855, 800/235-9748; fax 512/476-6399.

Duo RAM Upgrades

If you own a PowerBook Duo, you can use these RAM upgrade cards. A certified technician must install them, but once you've got that covered, you can boost your total on-board memory to up to 32MB. 4MB $199; 8MB $399; 14MB $650; 20MB $1250; 28MB $1950. Simple Technology, 714/558-1120, 800/367-7330; fax 714/558-0997.

EasyNet

Who would have thought that you'd be buying Ethernet transceivers as cheaply as you bought LocalTalk transceivers a few years ago? The EasyNet connectors plug into any Mac or device with a built-in Ethernet port and connect to either a 10BaseT or thin Ethernet network. Each box measures 2.25 inches by 1.5 inches by 0.75 inch and weighs about 2 ounces. $69. Dayna Communications, 801/269-7200, 800/531-0600; fax 801/269-7363.

MacWaveMaker

Plugging this 7-inch NuBus card into your Macintosh gives you a MIDI synthesizer that has stereo line-level outputs and MIDI-in and -out ports. The MacWaveMaker is a 32-voice polyphonic synthesizer with 357 instrument sounds; 48 digital echo, reverb, and chorus algorithms; and 15 different drum kits with over 400 percussion sounds. The board supports General MIDI, Roland MT-32, and Kurzweil Super-Orchestral MIDI sound tables. $695. Morning Star Solutions, 508/692-0373; fax 508/692-6535.

Magic RAID

These dual-drive arrays come in 1GB, 1.4GB, 2GB, and 3.4GB sizes, and are populated with Quantum and Seagate mechanisms. All the arrays have average access times of 4ms and sustained data-transfer rates of 8MBps, except for the 3.4GB model, which can reach 3.7ms and 10 MBps. All the arrays support RAID levels 0, 1, 4, and 5. 1GB $1899; 1.4GB $2399; 2GB $2699; 3.4GB $4338. Mac Products, 512/472-8881; fax 512/499-0899.

NPS 530

Small enough to fit in your hand (almost), this print server connects nearly any printer with a serial port to a 10BaseT network. The NPS 530 supports NetWare, LAN Manager, LAN Server, TCP/IP, and EtherTalk. $599; without TCP/IP $499. Axis Communications, 508/777-7957; fax 508/777-9905.



NPS 530

NuMedia 2

To make your thunderbolts and lightning louder and more frightening, you could try this 7-inch NuBus card. The card provides 16-bit stereo sound at sample rates up to 48kHz and has stereo line-level inputs and outputs for recording and playback. Since the card depends on the AT&T 3210 DSP chip, it is compatible with the Adobe AV DSP Power plug-in for Photoshop 2.5.1, and you can use it

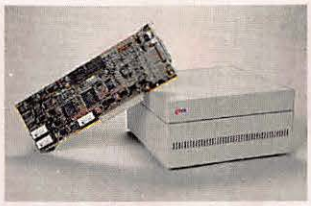
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to accelerate any graphics application that accepts Photoshop plug-ins. The NuMedia 2 ships with Killer Tracks Royalty-Free Music CD and Opcode's Audio Shop 2.0. $695. Spectral Innovations, 408/955-0366; fax 408/955-0370.

Pocket EtherTalk Adapter
You never know when you're going to have to network, but with Xircom's adapter, all you need to plug into an EtherTalk net is a SCSI port and the appropriate software. The Pocket EtherTalk Adapter features both DB-25 and HDI-30 ports, which makes it appropriate for PowerBooks or for providing a pass-through SCSI port for daisy-chaining other devices. The adapter draws power from the host Mac's ADB port. PET-10BT (10BaseT only) $349; PET-10BC (10BaseT and thin Ethernet) $399. Xircom, 818/878-7600; fax 818/878-7630.

Power Poker
A poker-playing and tutorial program, Power Poker includes 77 poker variations, and players can design their own. Built-in artificial intelligence learns your playing patterns, and the software features hand analysis, displays of historical hand strengths, and performance charts. Also, up to ten human players can play each other via LocalTalk or Ethernet. $49.95. Electronic Arts, 415/571-7171; fax 415/570-5137.

Power RAID Storage System
Put scads of data at your fingertips with these two-drive SCSI arrays. The



Power RAID Storage System

1GB and 1.4GB arrays feature 3.5-inch Quantum drive mechanisms, while the 2GB and 3.4GB arrays use 3.5-inch Seagate mechanisms. All of these arrays have average access times of 4ms. A 7-inch NuBus, SCSI-2 Fast and Wide card is included with the arrays. To turn these devices into RAID systems, you have to purchase additional software. The PRSS Lite software supports RAID levels 0 and 1, and the PRSS Full software supports RAID levels 0, 1, 4, and 5. 1GB $1709; 1.4GB $2399; 2GB $2699; 3.4GB $4148; PRSS Lite $190; PRSS Full $365. DGR Technologies, 512/476-9855, 800/235-9748; fax 512/476-6399.

PowerR Presenter 575
This output adapter plugs directly into the motherboard of the Macintosh LC 575 or the corresponding Performa model. It provides D-15 (Macintosh) and HD-15 (VGA) connectors for color or monochrome LCD panels, external monitors, and projectors. A version that supports the Mac LC 520 and LC 550 and corresponding Performa models is available as well. $129. PowerR, 206/547-8000, 800/729-6970; fax 206/285-0260.

PrecisionColor Display/21
There's something undeniably large about a 21-inch display, something that makes previously ordinary file icons seem tiny. This 21-inch multiresolution color monitor features a 0.28mm dot pitch, a maximum resolution of 1360 by 1024 pixels at 71Hz, and digital controls. Radius's Dynamic Desktop software, which allows instant resolution and bit-depth switching without restarting, is included. $2499. Radius, 408/434-1010, 800/227-2795; fax 800/966-7360.



PrecisionColor Display/21

QuickArray
Handling RAID Level 0 data striping at the hardware level makes these SCSI-2 arrays appear as single drives to your Macintosh. The QuickArrays feature access times equivalent to 4ms and are able to achieve data-transfer rates of 10 MBps. Each array comes with PLI's QuickSCSI-F NuBus SCSI accelerator. 1GB $3610; 2GB $4325; 4GB $7256. PLI, 510/657-2211, 800/288-8754; fax 510/683-9713.

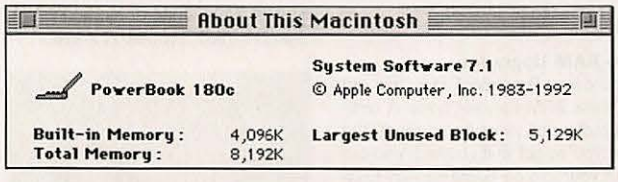
QuickSCSI-F
Why settle for data that crawls in through your built-in SCSI port at a measly 4MB per second when you can throw wide the gates to an information torrent? The QuickSCSI-F is a 7-inch NuBus SCSI-2 card that supports data-transfer rates up to 10 MBps. Macs with the card installed can boot from drives connected to it, and the QuickSCSI-F supports disk mirroring for instant backup. $699. PLI, 510/657-2211, 800/288-8754; fax 510/683-9713.

SlimWriter
At 12 inches by 8.5 inches by 1 inch, and 2.6 pounds (with battery), this 360-by-360-dpi thermal printer could nearly fit into one of the side pockets of your PowerBook case. The SlimWriter prints on plain paper, thermal bond paper, envelopes, and transparencies, all up to 8 inches wide. The printer works off a standard camcorder battery, which provides 50 minutes of operation (35 to 50 pages); high-capacity batteries are also available. The unit comes with an AC adapter. The required Macintosh adapter package includes a serial cable and driver software. The manufacturer estimates that the SlimWriter can print about 1 to 1.5 pages per minute. $399; Mac Pack $60. Atlantic Technologies, 910/350-0700, 800/779-7705; fax 910/392-7093.

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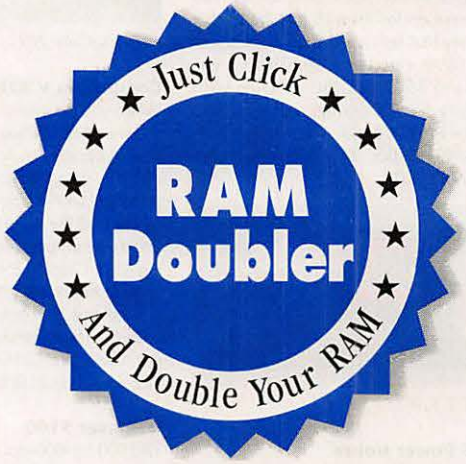
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Sound Advantage Hardware
If you want to work with sound, but your Mac doesn't have built-in sound input, this device connects to your Mac's serial port and provides a built-in microphone and two input jacks for an external microphone and a line-level source such as a CD player. The Sound Advantage Hardware also features a sliding volume control and a pass-through serial port. The device's maximum sample rate is 22kHz. The hardware ships with a software driver, which also provides voice-activated recording. Built-In Mic Options software, sold separately, works with Macs that have a built-in sound-input port, provides voice-activated recording, and controls digitization quality by tweaking the sample rate and the compression ratio. Requires System 6.0.7. $160; Built-In Mic Options $88. Heart Computer, 214/771-7511; no fax.



Sound Advantage Hardware

SoundMemo
Take a memo: this software can both record and play back sound files. When recording, SoundMemo automatically starts recording when dictation begins and stops when the speaker pauses. The pauses are automatically tagged and can be used to control playback. You can choose from Good, Better, and Best sound settings, or you can fine-tune recording sessions by choosing from 8-bit or 16-bit sample settings, sample rates up to 48kHz, and a range of compression ratios. SoundMemo is compatible with most current third-party sound-input boards. Requires System 7. $79.95. Imagemakers Software Systems, 905/472-0151, 800/203-6366; fax 905/294-0040.

SuperMatch 21T XL
A 21-inch multiple-resolution color monitor, the 21T XL features a Mitsubishi aperture grille tube (0.31mm aperture pitch) and can display resolutions up to 1600 by 1200 pixels. The monitor has digital controls (including a three-way adjustable white point) and a microprocessor that remembers the settings for each viewing mode. This display complies with both the MPR II emissions guidelines and the Energy Star guidelines. $2599. SuperMac Technology, 408/541-6100, 800/334-3005; fax 408/735-7250.

TV Elite for Macs
With this external video converter, you can put your Mac's 640-by-480-pixel–resolution video on a television. The box has both composite video and S-Video outputs, as well as an RGB monitor output, so your video appears on your television and monitor simultaneously. $399. Advanced Digital Systems, 310/926-1928, 800/888-5244; fax 310/926-0518.

Viking Duo RAM Upgrades
Having a PowerBook Duo is cool, but running out of memory is not. These RAM upgrades come in 4MB, 8MB, 12MB, and 20MB sizes and fit in any of the Duos, from the 210 to the 270c. You can also install the 20MB card and then piggyback an 8MB daughtercard on top of it to put a total of 32MB in your sleek gray road machine. 4MB $275; 8MB $525; 12MB $975; 20MB $1575; 8MB daughtercard $800; 28MB combo $2375. Viking Components, 714/643-7255, 800/338-2361; fax 714/643-7250.

XGT 6 X 8
Instead of scanning your paper drawings, you can skip the middle machine and sketch your ideas directly into your Mac with this graphics tablet. The XGT 6 X 8 has a 6-by-8-inch active area (1270-lpi resolution) on an 8.5-by-11-inch frame. The pad plugs into the ADB port and comes with a cordless, pressure-sensitive pen (256 levels). Driver software is included. $399. Kurta Corp., 602/276-5533, 800/445-8782; fax 602/276-9007.

SOFTWARE

BLAST Professional for Macintosh
This cross-platform telecommunications software relies on a proprietary transmission protocol to send your files up to two times faster than Xmodem. To realize that speed increase, your Mac must be talking to another machine that is also running the BLAST software; but BLAST Professional does support the more common Xmodem, Ymodem, and Zmodem protocols. The software can also perform terminal emulation (Wyse 50, VT52, VT100, VT220, and TTY), and it has a scripting language for automating tasks. $139. BLAST, 919/542-3007, 800/242-5278; fax 919/542-0161.



Drive7 3.0

Drive7 3.0
The latest version of this drive-formatting and -partitioning software features an updated interface, plus support for SCSI-2 and Apple SCSI Manager 4.3. The software package includes an application and a control panel, both of which now display logical unit numbers and volume names. Working with SCSI Manager 4.3, the application can update, format, or initialize all connected SCSI volumes from a single command.
continues



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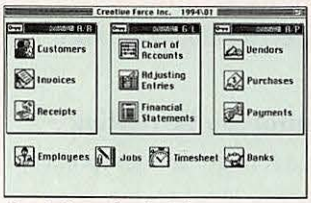
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Polaroid

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The control panel also now includes a caching feature that improves drive performance. $79.95. Casa Blanca Works, 415/461-2227; fax 415/461-2249.

Fourth Power Service 2.0
This 4th Dimension–based accounting software is designed for service-oriented companies and can handle job records, estimating, and quoting; proposal production; time tracking and billing; and forms creation. Fourth Power Service can automatically create everything from invoices to purchase orders, and it comes with built-in report editors and a word processor. $795. Honeybee Software, 514/954-0768, 800/667-1233; fax 514/875-2940.



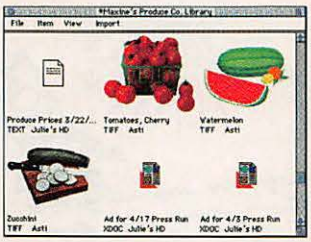
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Icontrol Human Resources
This software addresses such human-resources issues as employee tracking, including work history, reviews, and advancement/transfer requests. Icontrol HR can also track job applicants, benefits, and injuries and illnesses. The software generates required reports, including OSHA 101 and 200. 8MB min. memory; requires 68040. $1995. Icontrol, 605/886-3848, 800/222-4266; fax 605/886-4180.

MusicTime
If you're musically inclined, this software can help your Mac be that way also. If you have a MIDI instrument, MusicTime can record your performance and create sheet music that you can edit and print out. Alternately, you can compose by hand, with up to eight staves per system and up to four voices per staff. The software can also play notes as you type, acting as if your computer keyboard were a piano keyboard. 2.5MB min. memory; requires Mac Classic. $149. Passport Designs, 415/726-0280, 800/443-3210; fax 415/726-2254.

PortfolioMaker
If you're an artist, sending out slide portfolios to all and sundry can be an expensive proposition. But if you can scan or otherwise digitize your work, this software packs up to twenty 24-bit PICT images onto a single high-density floppy disk that you can duplicate and send out. You decide in what order to display the images, and you can optionally add text comments. The recipient can browse through the images and the text but cannot make any changes. Image size is approximately 3 by 5 inches (256 by 384 pixels). 4MB min. memory; requires System 7, color. $129. CRIT, 410/426-7733; fax 410/426-7768.

RRKeyFonts/Mac
Trying to describe a keyboard shortcut can be an exercise in frustration (or at least in long, hyphenated phrases). This font pack consists of RRMacCaps, depicting keys like ⌘, option, return, and control; RRKeyLetters, showing the alphabet, numbers, and punctuation surrounded by keylike boxes; and RRWinSymbols, depicting common Windows symbols and cursors. The package ships with both TrueType and PostScript Type 1 versions of the fonts. $49. RoadRunner Computing, 504/346-0019; fax 504/346-8144.



Touch

Touch
An XTension for QuarkXPress that creates and manages libraries of documents, including text files, graphics, and Quark files. Entries can be sorted in import order or by their volume, folder, file name, and type. Touch items may be dragged directly from their library into a Quark document and placed—a preferences dialog controls sizing of graphics imported in this way. Touch libraries can also include items from Aldus Fetch catalogs. Requires QuarkXPress. $179. Vision's Edge, 408/748-8411, 800/800-8476; fax 408/748-9584.

Word for Word—Macintosh 6.0
If you frequently need to translate files in a variety of different formats, you might consider the latest version of this document-conversion software. Word for Word reads and writes nearly 150 text, database, and graphics standards, including most common PC and Mac formats. If you have System 7, the software works with Apple's Easy Open extension, and you can convert documents by dragging and dropping them on the program icon. $149. Mastersoft, 602/948-4888, 800/624-6107; fax 602/948-8261.

XPreview
Preview your Quark documents without firing up the program. This software displays the document's vital statistics, including the colors, fonts, and imported graphics used, along with miniatures of each page of a file saved using the included Preview Editor Lite XTension. XPreview can have several documents open at once, and users can print out information about each document. Requires System 7. $79. Vision's Edge, 408/748-8411, 800/800-8476; fax 408/748-9584.

CD-ROMS

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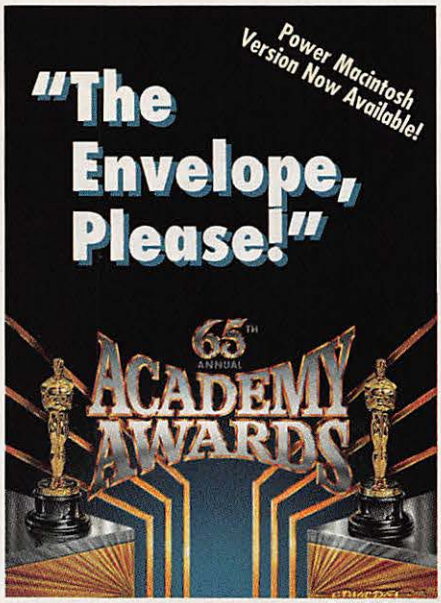
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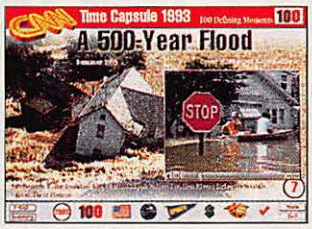
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broadcast footage from CNN, along with descriptive text and analysis. The clips are organized into such categories as sports, business, national news, and world news. You can also flag your personal favorites and file them in their own category. $29.95. Vicarious Entertainment, 415/261-1900, 800/908-9966; fax 415/299-8126.



CNN Time Capsule

Visual Symbols
Clip art can appear cartoonish, but this collection of images is closer to real life. The discs in this series contain pictures of items photographed against white backgrounds. The seven titles are Everyday Objects 1, 2, and 3; Just Tools; Just Hands; Just Documents; and Metaphorically Speaking. All discs are in Photo CD format and contain both screen- and print-resolution files of each image. Each disc contains over 100 images. $129. CMCD, 415/703-9900; fax 415/703-0711.

ACCESSORIES

PowerPlate QT1
When you're snapping photos, you don't want to run out of power. This battery power system attaches to the bottom of Apple's QuickTake 100 digital camera and wraps up and around the side to plug into the QuickTake's power port. You can recharge the PowerPlate with an AC adapter in about five hours (even while you are taking pictures), and the unit carries three times the power of the QuickTake's internal batteries, providing enough juice for roughly 600 photos. $129. Technöggin, 513/321-1777, 800/305-7936; fax 513/321-2348.

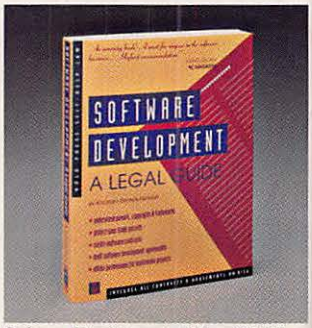
RollerMouse
This ADB trackball has a 5-inch-square footprint and four programmable buttons. The RollerMouse ships with driver software, but you control the resolution and button functions with a bank of DIP switches on the bottom of the unit. The buttons can be set to send common key combinations, such as ⌘-O, ⌘-N, and ⌘-Z. $119.95. CH Products, 619/598-2518, 800/624-5804; fax 619/598-2524.

SCSI Sentry
Keeping long SCSI chains operating can require an advanced degree in magic. This device plugs into your SCSI chain and actively controls the voltage and impedance on the chain. The idea is that the less noisy your SCSI lines are, the more likely your signal is to make it through unscrambled. The product requires an AC adapter (included). $99. APS Technologies, 816/483-6100, 800/235-2752; fax 816/483-3077.

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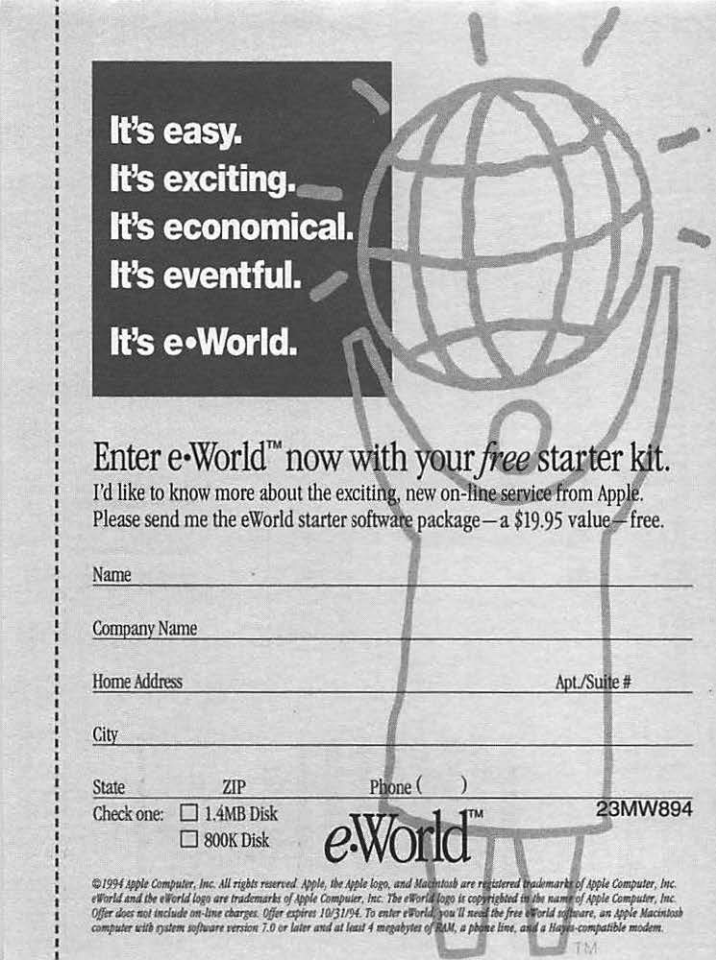
Software Development: A Legal Guide
Written in plain English, this handbook for software developers covers everything from employment agreements to intellectual property rights. Author Stephen Fishman writes about when to use copyrights and trademarks; how to draft employment, nondisclosure, and consultant agreements; how to obtain permission to use materials in multimedia projects; and how to avoid copyright infringement. An included disk contains contracts, agreements, and sample letters covered in the book. 300 pages. $44.95. Nolo Press, 510/549-1976, 800/992-6656; fax 510/548-5902.



Software Development: A Legal Guide

Zap!
Subtitled "How your computer can hurt you—and what you can do about it," this book covers computer-related health issues, including eyestrain, carpal tunnel syndrome, and back problems. *Zap!* discusses these health hazards and analyzes the solutions available to users. Author Don Sellers makes suggestions on how to avoid or correct problems and provides a resource list of furniture manufacturers, software developers, accessory sources, newsletters, books, government agencies, and online resources. 150 pages. $12.95. Peachpit Press, 510/548-4393, 800/283-9444; fax 510/548-5991. m

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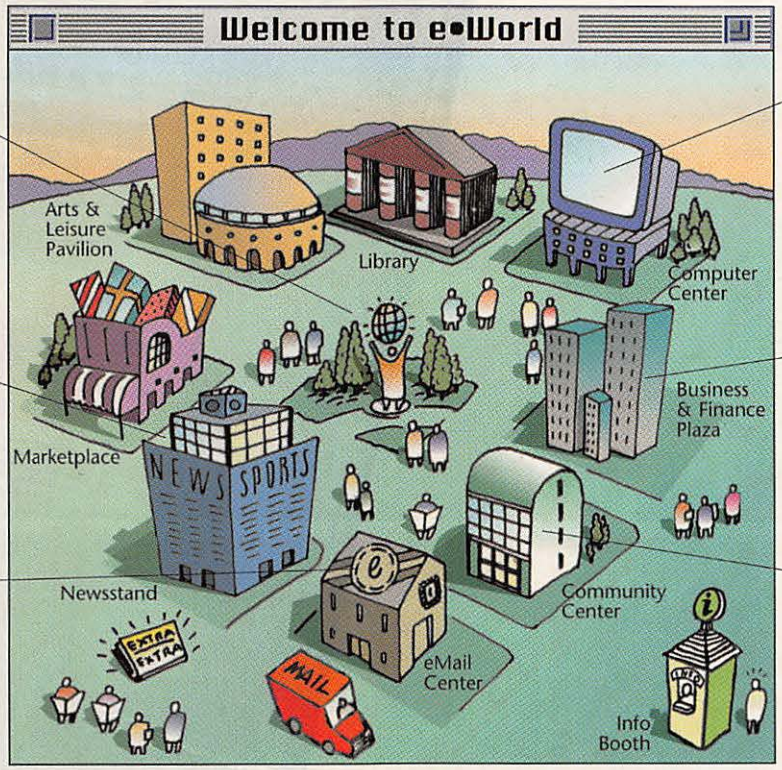
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The PowerBook 500 Series. In brief.





Apple

The PowerBook 500 Series. In depth.

Welcome to the next generation of PowerBook.

Four new Apple® PowerBook computers that redefine, once again, what a notebook computer can be.

One look tells you these are very new indeed. The flowing shape. The sleek lines. The futuristic curves.

But the new appearance is only your first clue to the dramatic changes, refinements and improvements we've engineered inside.

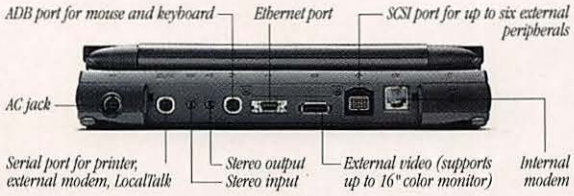
More power. The PowerBook 500 series is designed around the Motorola 68LC040 processor—a chip that offers far more power than the chips that powered previous PowerBook models.



The revolutionary new Apple trackpad makes pointing and clicking even more intuitive than before.

In benchmark tests, the new PowerBook 540c running at 66/33 MHz was 80% faster than the fastest previous PowerBook. (Its gray-scale counterpart, the 540, is equally fast.) And with the same chip running at 50/25 MHz, the 520 and 520c aren't far behind.

We've supported that processing power with 80% more memory capacity (up to 36MB), 56% more internal storage capacity (up to 320MB) and built-in high-performance Ethernet networking (as well as LocalTalk®).



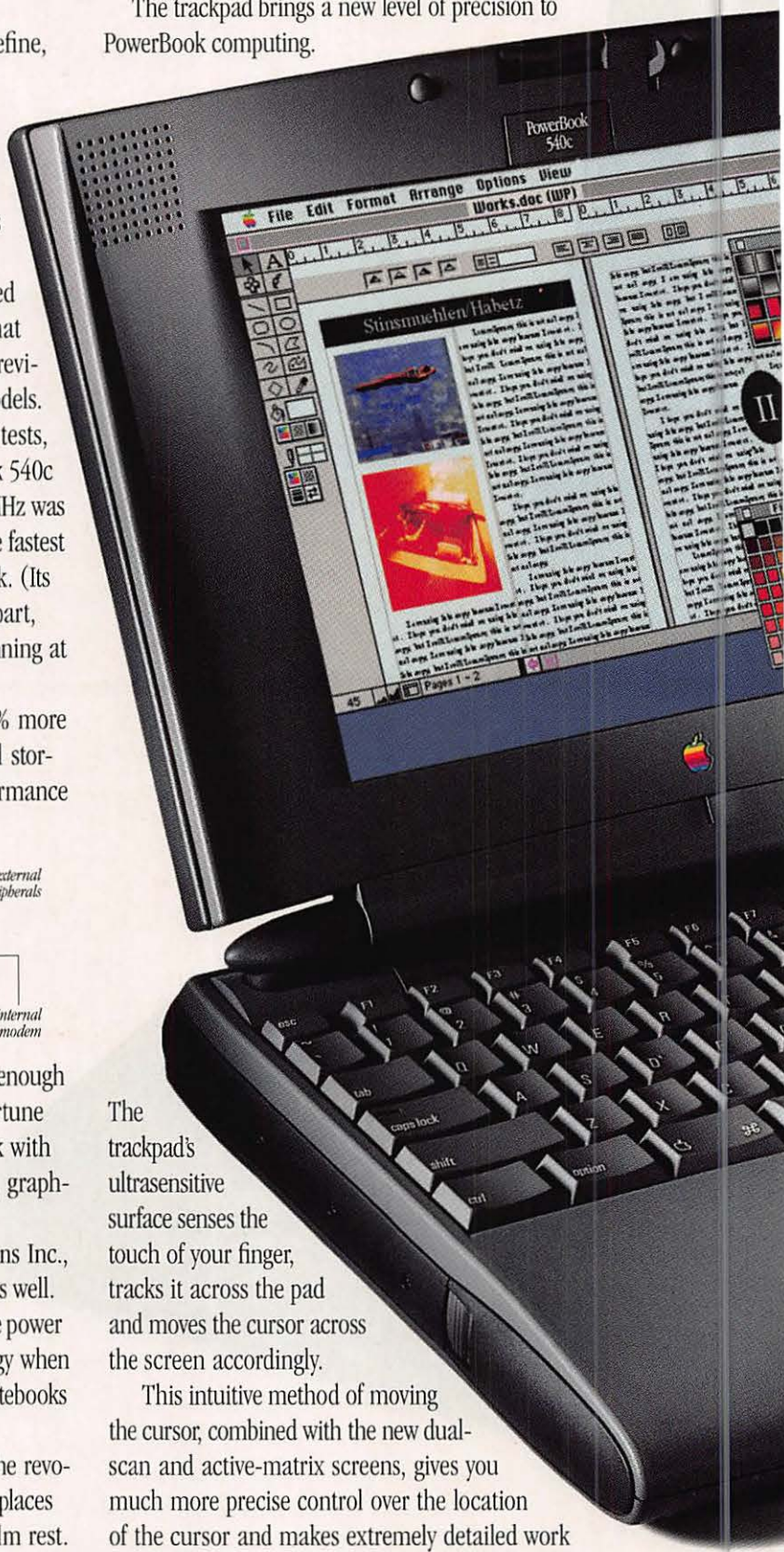
This makes the PowerBook 500 series powerful enough not only for word-processing long documents or Fortune 500-sized spreadsheets, but also for doing fieldwork with programs like Adobe Photoshop and other high-end, graphics-intensive programs.

Add SoftWindows™ software from Insignia Solutions Inc., and you've got the ability to run MS-DOS programs as well.

The 500 series offers the possibility of even more power later, because you can upgrade to PowerPC™ technology when it's available for PowerBook. (Contrast this with 486 notebooks that aren't upgradable to Pentium technology.)

More precision. Kindly direct your attention to the revolutionary new Apple trackpad pointing device that replaces the trackball and is centered on the comfortable palm rest.

The trackpad brings a new level of precision to PowerBook computing.



The trackpad's ultrasensitive surface senses the touch of your finger, tracks it across the pad and moves the cursor across the screen accordingly.

This intuitive method of moving the cursor, combined with the new dual-scan and active-matrix screens, gives you much more precise control over the location of the cursor and makes extremely detailed work

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possible (it's actually precise enough for photo retouching) wherever you happen to be.

The PowerBook 540c has what may well be the finest screen ever to grace a notebook computer: an active-matrix, 9.5-inch display capable of showing thousands of colors at the same time. Combined with QuickTime™ video and built-in stereo sound, these screens make for truly spectacular presentations in the most unspectacular locations: on a crowded plane, in a noisy diner, wherever.



These are the first PowerBook computers to use PCMCIA technology.

More expandability. The new PowerBook 500 series includes a lot of things that aren't standard on ordinary notebook computers.

Things like built-in file sharing and networking. Stereo sound and video-out. Macintosh PC Exchange™ software, eWorld™ and PowerBook File Assistant file-synchronizing software. And we've even included Apple Remote Access software that allows any modem-equipped PowerBook to work with the Macintosh® computer on your desk, and with your network, as if you were sitting in your office. Even during those times when your office happens to be thousands of miles away.

Still, there's a lot of room to grow. These are the first PowerBook computers to come with a built-in Processor Direct Slot (PDS) for third-party expansion modules. And they're also the first ones to offer the optional plug-in PowerBook PCMCIA Expansion Module, so you can use two Type II or one Type III PCMCIA card for even more flexibility.

You can even install an optional 19,200-baud internal modem to send and receive information quickly, and when it becomes available, a third-party cellular interface for convenient wireless access to your office network.

More battery life. Even the batteries have been thoughtfully redesigned. The PowerBook 500 series can use two PowerBook Intelligent Batteries. These high-powered NiMH batteries use special processors within each pack to monitor battery power and the new PowerBook Control Strip — power management software that tells you exactly how much time you have before you need to recharge the batteries.

	PowerBook 520	PowerBook 520c	PowerBook 540	PowerBook 540c
Processor	*Motorola 68LC040 @50/25 MHz*		*Motorola 68LC040 @66/33 MHz*	
Display	*FSTN Gray-Scale*	*Dual-Scan Color*	*Active-Matrix Gray-Scale*	*Active-Matrix Color*
Hard Drive	*160MB*	*160MB*	*240MB*	*320MB*
Memory	*4MB DRAM expandable to 36MB*			
Battery Life	*Up to 7 hours with 2 batteries*		*Up to 6 hours with 2 batteries*	
Audio	*16-bit stereo in and out, built-in stereo speakers and mono microphone*			

The result is 40% more battery life than before — up to seven hours per charge — when using both batteries.

They recharge faster, too — in as little as two hours for both batteries when the PowerBook is asleep or shut down. And the batteries even recharge while you're using the PowerBook.

More information. While this has been an abundance of information, by any standard, it can't serve as a substitute for a personal demonstration. Something that can be easily arranged at your authorized Apple reseller. To find the one nearest you, simply call 800-732-3131, ext. 100. (In Canada, call 800-665-2775, ext. 910.)

And soon discover more of the power you buy a PowerBook for. The power to be your best.®



Introducing the PowerBook 500 Series.
The next generation of PowerBook.

Apple®

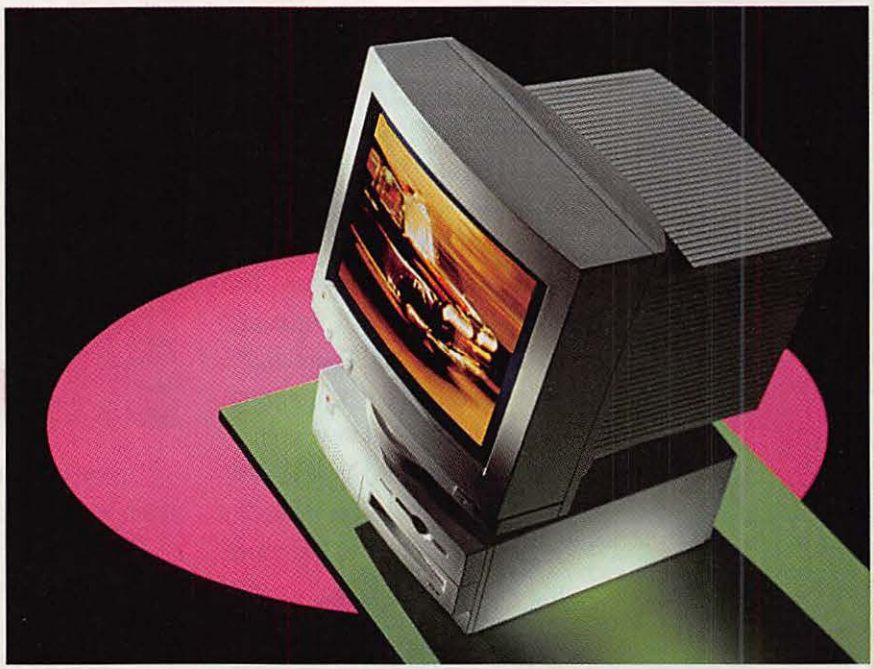
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Power Macintosh 7100/66

Macintosh Computer

PROS: Three expansion slots; fast CPU. **CONS:** Awkward video implementation. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** Base model $2899.

MW ★★★★★



QUADRA, MOVE OVER. THE Power Mac 7100/66 is poised to be the next standard business Macintosh desktop model. The Centris and Quadra 650 have become the business Macs of choice because they combine power and expandability—and the Power Mac 7100, which looks like a Quadra 650, should assume the same role. Based on my experiences with early native-PowerPC software, I expect the ultimate performance of the 66MHz 7100—with all native programs—to be about two to three times that of a Quadra 650 (see "Native Power Mac Software Performance").

Ever-Changing Performance

The Power Mac 7100, running 680X0 programs in emulation, is about as fast as a IIfx, according to Macworld Lab tests. Our standard tests use programs that were available only in 680X0 versions at test time. Aldus FreeHand and PageMaker and Specular International Infini-D later shipped in native mode; QuarkXPress is expected by July. The three other programs in our test suite are on the slow track to native versions: Microsoft Excel and Word (slated for August releases) and Claris FileMaker Pro (no firm date).

As the applications you use begin to ship in native versions, you'll see some of the promised two-to-four-times-a-Quadra-650 speeds. Till then, the chief advantage of a Power Mac is bragging rights. Still, the reasons to delay buying a Power Mac are beginning to evaporate.

Weird Video

The Power Macs are the first Apple computers with two video ports built in. One, on the back panel, uses an AV-style connector and the system RAM to carry the video signal (like the IIci). The other is on the bundled PDS-based video card (on an AV Power Mac, there's an AV card in the PDS slot that also offers a video port). The PDS video card uses a standard Mac video connector and video RAM (VRAM) to carry the video signal.

Is there an advantage to using one video port over the other? Sometimes. The performance of the back-panel video connector and the PDS card are about the same—about equal to a Quadra 700's internal video, but the PDS card's video supports larger monitors at higher resolutions: up to 16-bit on a 19-inch monitor and up to 24-bit on a 16-inch monitor, if you have 2MB of VRAM on the card. (For PDS cards with 1MB of VRAM, or for AV cards with the TV-video ports in use, the Power Mac 7100 supports 8-bit color on a 19-inch monitor, 16-bit color on a 16-inch monitor, and 24-bit color on a 14-inch monitor.) The back-panel video is limited to 8-bit color on 16-inch monitors and 16-bit color on 14-inch monitors.

The speed of the Power Mac's video, while less than that of a Centris or Quadra 650, is fine for most users. Apple has clearly decided that fast video should be an integral part of a system and not an add-on. If you need very fast video, you'll want to get a NuBus-based video accelerator anyhow. (And then you can connect three monitors to your Power Mac!)

It's convenient to have two monitor connectors, but Apple's implementation is strange. Most people don't have AV monitors, so they must plug their monitors into the PDS card or buy an adapter cable to use the back-panel port. And for the AV cards, why not use an AV video connector instead of the standard video connector? (From an engineering standpoint, it was easier to put the AV connector in the back; the motherboard there includes circuits for ADB and sound, whose control chips are nearby.)

Apple also says the Power Macs support VGA and Super VGA multimode monitors—the PC standards—via the PDS card video. That's true only with the right video adapter. Note that a Mac-to-VGA adapter for a Centris or Quadra may not work as you'd expect on a Power Mac. The Power Macs now support multiresolution displays (including Apple's latest models), so you can change the pixel resolution from, say, 832 by 624 to 1024 by 768 to view a large image—without restarting. VGA monitors have done that for years, although a restart is required. But the Power Mac won't know that a VGA monitor is multiresolution unless the adapter tells the Power Mac so. Ask your monitor maker for a new adapter; companies like NEC Technologies offer them for free (312/622-7427).

Both of my video concerns are minor issues—neither affects the vast majority of users, and neither lacks a solution for the users who are affected.

With Apple's new strategy of developing Mac platforms that several models can be based on—the Centris 650, Quadra 650, Quadra 800, and Quadra 840AV all have the same basic motherboard design, while the IIvx, Centris 650, Quadra 650, and Power Mac 7100 all have the same case—it's not surprising that the 7100 looks like its 040-based counterparts. There's not much to say about its hardware—the 7100 has the standard devices and ports.

Apple did make built-in Ethernet connectors (for which you need a transceiver) standard for all Power Macs, and 8MB of RAM is now a standard on-board configuration. You'll probably need that RAM, since early indications are that Power Mac software uses more RAM than 680X0 software. Power Mac software also typically takes more disk space, so make sure you get a big hard drive—consider 250MB a minimum, with 500MB a more realistic amount.

The 7100 has one option you should strongly consider adding: a cache card. This boosts performance by about 15 percent for standard programs and by as much as 45 percent for programs that use a lot of floating-point math, such as modeling and scientific-analysis software.

The use of the PDS for the video or AV card also means this slot cannot be used for expansion devices, except for third-party video cards (which no one has yet indicated interest in developing).

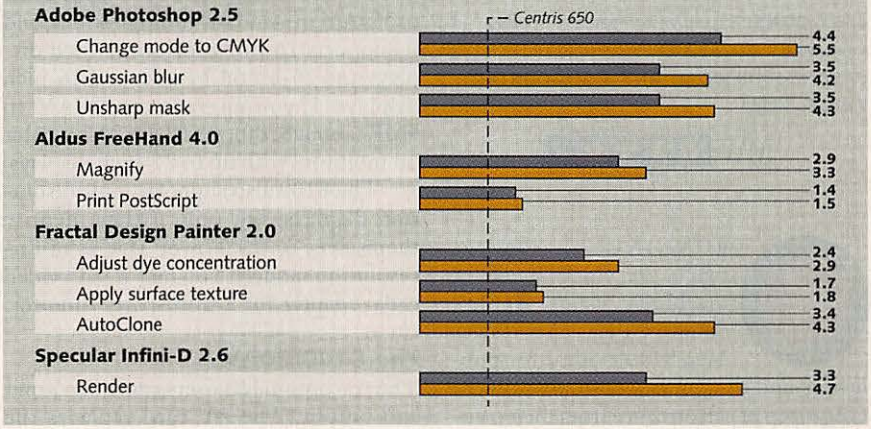
A Great Mac

The Power Mac 7100/66 is the Mac I'd like to have—once the native software I use is available, of course. If you have the money—figure $4000 for a model with a 500MB drive, 256K cache card, 16MB of RAM, keyboard, and monitor, but no CD-ROM drive—the 7100 makes an outstanding workstation whose power should last you for several years, even with the inevitably faster Macs based on faster PowerPC 601 and PowerPC 604 CPUs that are likely to ship next year. A $4000 price is nothing to take lightly, but the Power Mac 7100 delivers every dollar's worth.—GALEN GRUMAN

MW LAB Native Power Mac Software Performance

For these tests we used shipping versions of the Power Mac 7100/66 and 8100/80 (each with a total cache of 512K) and shipping versions of native Power Mac software. For each program, we tested several typical tasks. The results are strong examples of native Power Mac software's speed versus the speed of 680X0 software.

Bars represent times as fast as 680X0 software running on a Centris 650 (Centris 650 = 1.0). **Power Mac 7100/66** **Power Mac 8100/80** **Longer bars are better.**



MW LAB Power Macintosh 7100/66: How Fast Is It?

Best result in test. Products are listed in increasing order of overall performance.

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

Common

Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.

Scientific

We added to the common tasks several scientific calculations (which use floating-point math).

BUSINESS-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks within each class. For each type of system, results can be compared with other *Macworld* Business-System Performance Times.

Processor

Several tasks in Adobe Photoshop, Aldus FreeHand, Claris FileMaker Pro, and Microsoft Excel and Word.

Drive Access

File opens in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.

Video Display

Horizontal and vertical scrolling in Microsoft Excel and Word, and QuarkXPress.

Floating Point

Scientific recalculations (which use floating-point math) in Microsoft Excel.

	Common	Scientific	Processor	Drive Access	Video Display	Floating Point
Power Mac 7100/66*,**	6.6	6.5	335	65	78	242
Power Mac 7100/66**	5.1	5.0	383	74	104	348
Power Mac 6100/60**	4.7	4.5	380	80	116	377
Quadra 840AV	16.5	28.8	118	59	49	18
Centris 650	12.8	21.8	162	60	65	24

*With optional 256K cache. **Using 680X0 programs.

Power Macintosh 8100/80

Macintosh Computer

PROS: Fast 80MHz CPU; tower case with three expansion slots and room for two 1GB hard drives. **CONS:** Expensive compared with other Power Macs. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** $4249.

MW ★★★★

RUNNING AT 80MHZ, twice the clock speed of machines using Apple's 68040 CPUs, the Power Mac 8100 is ideal for publishers and designers who must squeeze every drop of performance from their computers. But of course there's a hitch: to get that speed, you need applications written in code native to the PowerPC chip.

The 8100 runs 680X0 applications at the speed you might expect from a Quadra 610, according to Macworld Lab tests. So if you now use a fast Quadra, you might want to wait until the software you need is in a stable native version (see "Native Power Mac Software Performance" in the Power Mac 7100 review).

Recognizing that LocalTalk is too slow for professional users and that many Macs must coexist with DOS machines, Apple has made Ethernet standard on all Power Macs and has bundled Macintosh PC Exchange with the Power Mac version of System 7.

Like all Power Macs, the 8100 can support two monitors simultaneously. The first option, an AV-style monitor port on the Power Mac's back panel, uses DRAM to give you 8-bit color on 16-inch monitors and 16-bit color on 14-inch displays. The second option is a PDS-based video card that uses VRAM installed directly on the card. The 8100 offers 2MB of VRAM in standard configurations, and it supports 16-bit color on 21-inch displays and 24-bit on 14-inch and 16-inch displays. If you upgrade the VRAM to 4MB (about $200), you'll get 24-bit color on monitors with up to 21-inch displays.

The 8100 also supports multiresolution displays, but only if they identify themselves to the Power Mac as multiresolution models. You may need a video cable adapter for a third-party monitor.

The 8100/80AV

The AV option lets users add video input and output. The AV card replaces the standard video card in the 8100's PDS slot and adds three ports: one for a second monitor and two for S-Video.



MARK JOHANN/SCREEN IMAGE-TONY STONE IMAGES

While the 8100's speed does improve AV performance, there still isn't much new AV technology available for Power Macs. Until AV software catches up with PowerPC technology, the AV Power Macs don't live up to Apple's promised telephony and voice-recognition features.

Expanding the 8100

Most users will add more options to the powerful base design. Users of QuickTime or 3-D rendering applications, for example, need lots of storage space. In addition to the 3½-inch, third-height hard drive and 3½-inch floppy drive included with the base model, the tower case has room for another full-height 3½-inch drive (or two half-height drives) and a 5¼-inch removable-media bay for a CD-ROM player or SyQuest drive. To access the extra drives quickly, the 8100 features a dual-channel SCSI interface; the internal SCSI channel supports data transfers at up to 10 Mbps, and the external channel supports up to six other SCSI devices that don't require such high-speed transfers. The high-speed channel even supports an internal disk array.

The 8100 is fast and will only get faster as software goes native and developers take better advantage of the PowerPC chip's power. And if you want to add multimedia, the 8100 offers top-of-the-line speed and expandability. But this Power Mac is expensive when compared with its DOS equivalents, or even with the Power Macintosh 7100: the more than $1000 price difference buys you essentially an extra 20MHz of speed, a dual SCSI port, and a tower case.

While it doesn't quite offer the excellent price/performance ratio of the other two Power Macs, you should consider the 8100 if you're a high-end user moving your work over to RISC-based computing.—MATTHEW HAWN AND DANNY LEE

MW LAB Power Macintosh 8100/80: How Fast Is It?

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

BUSINESS-SYSTEM PERFORMANCE TIMES

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Best result in test. Products are listed in increasing order of overall performance.

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	Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.	We added to the common tasks several scientific calculations (which use floating-point math).	Several tasks in Adobe Photoshop, Aldus FreeHand, Claris FileMaker Pro, and Microsoft Excel and Word.	File opens in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.	Horizontal and vertical scrolling in Microsoft Excel and Word, and QuarkXPress.	Scientific recalculations (which use floating-point math) in Microsoft Excel.
Power Mac 8100/80*	8.1	8.0	256	57	66	187
Power Mac 6100/60*	4.7	4.5	380	80	116	377
Quadra 840AV	16.5	28.8	118	59	49	18
Centris 650	12.8	21.8	162	60	65	24

*Using 680X0 programs.

Newton MessagePad 110

Personal Digital Assistant

PROS: Better handwriting recognition and more RAM than original MessagePad; improved battery life; improved case design. **CONS:** Handwriting software still frustrating; lack of business software. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** $599; ROM upgrade for original MessagePad $99.

MW ★★★

LET'S GET THIS STRAIGHT AT THE start: the Newton MessagePad 110 is not radically different from the original Newton MessagePad. Don't expect it to recognize all your handwritten notes all the time. Don't ditch your PowerBook in favor of a much smaller PDA just yet. The Newton MessagePad, like PDAs in general, still lacks that one killer application that will make people realize they really do need a Newton.

With the Newton MessagePad 110, Apple provides more-versatile handwriting recognition, more memory, longer battery life, more-efficient design. When software developers and the market in general catch up, Newton technology will offer a stable platform.

Safer to Carry, Delightful to Hold

The MessagePad 110 has a sleeker design than the original MessagePad. The 110 also has a cover that protects the screen when you're not using the Newton. This is a good addition, as any product designed to go everywhere I go better have as much protection as possible. The 110 is a little longer and thinner than the first MessagePad, making it more comfortable to hold in one hand while writing with the other hand. The new stylus is rounder and heavier than the original, which makes it feel more like a pen. It has a telescope-like design that allows it to collapse so it's out of sight after you return it to its home in the upper-right-hand corner of the MessagePad.

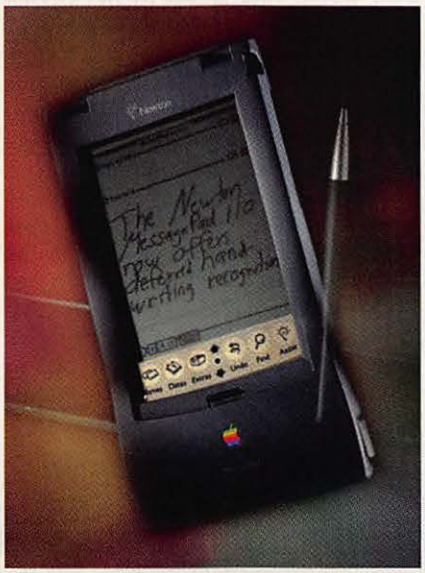
The Recognition Factor

The most significant feature of the MessagePad 110 is its improved handwriting recognition. No, it still isn't 100 percent accurate, but heck, I'm not even 100 percent accurate at recognizing my handwriting. The new ROM-based handwriting-recognition software now supports deferred handwriting recognition and letter-by-letter recognition.

With the original MessagePad, if you don't have handwriting recognition turned on, your notes are saved as digital ink and are destined to remain digital ink until they are deleted; you can't go back and convert the notes into ASCII text. With the 110, you simply select the digital ink you want to recognize (by holding down the pen and dragging across the text). Then, when you double-tap on the highlighted text, the MessagePad attempts to recognize your handwriting.

If you use your MessagePad to take notes during meetings, you'll appreciate deferred handwriting recognition—it can be distracting to watch the MessagePad try to recognize your handwriting as you concentrate on what you're writing.

The other major improvement to the 110's handwriting-recognition capabilities is letter-by-letter recognition. In the original MessagePad, recognition is



TOM GIBSON

strictly word-based. That is, the MessagePad attempts to recognize words by matching them to entries in your word list. While this method is fast and generally reliable, the addition of letter-by-letter recognition is great for proper nouns that most likely are not in the word list. If the MessagePad 110 butchers a word, tapping on that word brings up a list of possible alternatives and offers you the option of letter-by-letter recognition. If you write legibly, letter-by-letter recognition works well. For example, the 110 recognized *Macworld* as *MacLeod;* however, when I switched to letter-by-letter recognition, the 110 got it right. Or if you know that you are about to write a series of names that aren't in the word list, you can turn on letter-by-letter recognition. Also, after you use letter-by-letter recognition to identify a word, you can add it to the word list.

If you own the original MessagePad, you can get the improved handwriting-recognition capabilities by upgrading to the new ROM ($99). In addition to the 110, Apple sells the MessagePad 100 ($499), which uses the same case design as the original. The 100 has the same ROM as the 110, so you get the improved handwriting-recognition features.

In addition to new ROMs, the 110 has 1MB of RAM, which is a big plus because the Newton uses its RAM for active memory as well as storage. Of the original MessagePad's 640K of RAM (the MessagePad 100 also will have only 640K), only about 140K is available as work space. The 110 offers about 520K for work space, which reduces the need to buy a RAM expansion PCMCIA card.

The MessagePad 110 also has longer battery life, thanks to four AA alkaline batteries or a rechargeable NiCad battery. During my use I never received a low-battery message.

Make the Connection

Apple has also released version 2.0 of Newton Connection Kit ($99). This new version has filters for WordPerfect 3.0, Word 4.0 and 5.0, ACT 1.1, Dynodex, Address Book Plus, DateBook Pro, Now Up-to-Date, and others. If you can't picture yourself entering and reentering hundreds of names, addresses, phone numbers, and calendar events using the Newton's handwriting recognition, you'll appreciate the connection kit.

The MessagePad 110's beaming capabilities provide an easy way to exchange data with other MessagePads and infrared devices. And the 110's infrared transceiver now supports transmission speeds of up to 38.4 Kbps. It's true that you don't see a lot of people running around beaming stuff to Newton MessagePads nowadays. However, if Apple decides to add infrared transceivers to Macs and printers, the MessagePad's faster infrared-transmission capability will become much more relevant.

Has the Newton Come of Age?

The MessagePad 110 is the Newton that Apple should have shipped last August, so in many ways it simply brings Newton technology to where you'd expect it to be. Still, Apple deserves praise for recognizing the Newton's shortcomings and acting quickly to correct them. Using the MessagePad 110 was a pleasant experience. Now all I need is a reason to use it.

—DAN MUSE

OrangePC Model 200 Series

PC Coprocessor Cards

PROS: Fast; works in most Power Macs and 680X0 Macs; can be networked; allows expansion. **CONS:** Expensive; not as fast as CPUs' rated speeds. **COMPANY:** Orange Micro (714/779-2772). **COMPANY'S SUGGESTED PRICE:** $1139 to $3237, depending on model and configuration.

MW ★★★★



WHAT'S THE BEST WAY to run Windows from your Macintosh (assuming you are so inclined)? Today, you have several choices, including Farallon Computing's Timbuktu Pro for controlling a PC remotely (see *Reviews*, May 1994), Apple-endorsed SoftWindows from Insignia Solutions (see the review in this issue), and Orange Micro's OrangePC cards.

The new Model 200 series revamps the Orange Micro line so that all the cards use one of the 80486 CPUs that are the backbone of business PCs today.

There are three basic cards in the OrangePC lineup: the Model 210, which comes with 4MB of RAM, a serial port, a parallel port, and standard VGA video (16-color, 640-by-480-pixel resolution); the Model 250, which comes with 8MB of RAM, a PCMCIA slot, and Super VGA video (256 colors at up to 800-by-600-pixel resolution); and the Model 290, which is essentially a Model 250 with 16MB of RAM and a cable that adds a serial and parallel port.

The PCMCIA slot lets you insert drives, SCSI adapters, and network cards, while the serial and parallel ports enable you to connect to fax modems, input devices, and printers.

All three models work in any Mac that can take 12-inch NuBus cards: that's all Macs except the IIsi, Centris 610, Quadra 605 and 610, Centris and Quadra 660AV, and Power Mac 6100. The OrangePC software works on the Power Mac 7100 and 8100 and on 680X0 Macs.

The OrangePC software lets you share volumes (folders or disks) between the PC and the Mac. If you use Apple's Macintosh PC Exchange 2.0, you can even share a PC SCSI disk that is connected to your Mac's SCSI port, although disk access slows considerably. If you want speedy disk access to an external drive, get a PCMCIA-based drive or SCSI adapter.

With the OrangePC, you can give your Mac a faster CPU for Windows work, so it's easy to put together the performance and features you want.

But the combination of expansion and speed is expensive. OrangePCs cost from $1139 for the lowest-end Model 210 (which uses a 33MHz 486SX) to $3237 for the highest-end Model 290 (which uses a 100MHz IntelDX4). That's about 30 percent more than it costs to buy an equivalent Windows PC—monitor, keyboard, drive, the whole works.

You might attempt to justify the cost based on the fast speed of the 486 CPUs that the OrangePC cards use. But the speed you get does not match the rated speed of the CPU. For example, an OrangePC card using a 33MHz 486SX performs more like a PC using a 25MHz 486SX, while an OrangePC card using a 66MHz 486DX2 performs more like a PC using a 33MHz 486DX. The slowdown is due to the overhead of managing the PC card.

Still, the OrangePC cards are faster than any other Windows Mac option, as shown in Macworld Lab tests. If your goal is to get a Macintosh that runs Windows as fast as a PC, you can't get there from here. If your goal is to get business-level performance for day-in, day-out use, you can.

And although the price for the processor cards is steep, it's not out of line. In fact, if you compare the total cost of a Power Macintosh 7100/66 with a 33MHz 486SX-based OrangePC Model 210 card and Windows (it's not included with the card) against that of a Power Mac 7100/66 with SoftWindows and the extra RAM and cache, it's a difference of only $375. That's not much, considering the much better performance of the Model 210. But for faster OrangePC cards, the price difference starts to loom large, and you have to ask yourself whether you're buying too much power.

—GALEN GRUMAN

MW LAB

Orange Micro Comparison

Best result in test. Products are listed in decreasing order of overall performance.

	CORE-PERFORMANCE INDEX		WINDOWS-PERFORMANCE INDEX				
	Times as fast as a Classic (Classic = 1.0).		Times as fast as a 33MHz 486DX PC (486DX = 1.0).				
	Common Typical tasks that use the processor, drives, and video display.	**Scientific** We added to the common tasks several scientific calculations.	**Aldus Info Publisher 2.0** Database queries and data sorts.	**Lotus Ami Pro 3.01** Find and replace, layout reformat, and file-format conversion.	**Lotus 1-2-3 4.01** Integer and floating-point calculations, file opens, and scrolls.	**Microsoft Access 1.1** Report generation, file-format translation, and data sort.	**Overall** Combination of Windows-Performance Indexes.
66MHz 486DX2 (Gateway 2000 4DX2-66V)	23.0	62.1	1.5	1.7	1.4	1.3	1.5
OrangePC Model 290 (100MHz IntelDX4)[A]	27.4	79.0	1.5	1.8	0.9	1.5	1.4
33MHz 486DX (AMI 486/33)	15.5	36.3	1.0	1.0	1.0	1.0	1.0
OrangePC Model 290 (66MHz 486DX2)[A]	19.6	55.7	1.0	0.6	0.8	1.0	0.9
33MHz 486SX (Tandy 3100 Model 10)	16.0	16.6	1.0	0.9	0.3	0.9	0.8
OrangePC Model 210 (33MHz 486SX)[A]	12.9	14.1	0.8	0.8	0.2	0.6	0.6
25MHz 486SX (Tandy 3100 Model 10)	12.1	12.6	0.9	0.6	0.2	0.6	0.6
Timbuktu Pro 1.1 (33MHz 486DX)[B]	11.0	31.1	0.7	0.5	0.3	0.7	0.6
Apple DOS Compatible Card (25MHz 486SX)[C]	11.9	12.7	0.6	0.7	0.2	0.6	0.5
SoftWindows 1.0 (Power Mac 8100/80)	8.6	14.4	0.5	0.6	0.4	0.4	0.5
SoftWindows 1.0 (Power Mac 7100/66[D])	7.8	13.0	0.3	0.5	0.3	0.3	0.3
SoftWindows 1.0 (Power Mac 7100/66)	6.5	10.0	0.3	0.4	0.3	0.3	0.3
SoftWindows 1.0 (Power Mac 6100/60[D])	5.9	10.6	0.3	0.3	0.3	0.3	0.3
SoftWindows 1.0 (Power Mac 6100/60)	5.0	7.4	0.2	0.2	0.2	0.3	0.2
SoftPC 3.1 (Centris 650)	1.6	2.8	0.1	0.1	0.1	0.1	0.1

[A] *On a Centris 650.* [B] *From a Centris 610 over a LocalTalk network.* [C] *4-bit color, with 8MB of system RAM.* [D] *With 256K cache.*
All systems used 8-bit color with 16MB of system RAM, unless otherwise noted.

SoftWindows 1.0

Windows Emulation

PROS: Faithful emulation of Windows 3.1.
CONS: Requires significant RAM; sluggish; does not support several Windows programs.
COMPANY: Insignia Solutions (415/694-7600).
LIST PRICE: $499.

MW ★★

INSIGNIA HAS A TOUGH CHALLENGE: to deliver Windows on a Mac completely via software. The Power Macs are here, and so is SoftWindows—with a strong endorsement by Apple. Does SoftWindows solve the speed problem? No, although performance is now acceptable for low-end business needs. More important, is SoftWindows a long-term solution to Windows compatibility? Perhaps, but there's no guarantee that it can keep up with forthcoming releases of Windows or new Microsoft technology.

SoftWindows delivers its main promise: you can run Windows programs, on a Mac, in a Windows window. Insignia has a license from Microsoft to use the Windows 3.1 code, and sure enough, you get real Windows. But there are prices to pay for the ability to run Windows via emulation.

One price is the performance. While SoftWindows runs at four to six times the speed of Insignia's SoftPC, that's still at the level of bottom-end Windows machines, ranging from a fast (33MHz) 80386DX (approximately equivalent to the performance of a Mac IIfx) to a slow (25MHz) 80486 (approximately equivalent to a Centris 610). SoftWindows' performance varies by application. This performance is fine for standard programs used occasionally, such as accounting packages and databases.

A second price is compatibility. Yes, SoftWindows contains real Windows code, but it runs only in Standard mode. That means it acts like it's working on an 80286-based PC (such as IBM's long-discontinued AT). The 286 has been dead for several years, and even the 386 has been basically out of the business picture for more than a year. Now that Pentiums are starting to overtake the 486, Windows software developers are dropping support for the 286 and requiring a 386 or better CPU. By targetting users who have 386, 486, or Pentium PCs, software developers can take advantage of Windows' Enhanced mode and its better memory-handling, multiple-program-interaction, and protected-services features.

But Enhanced-mode programs won't work under SoftWindows. System-level services like OLE 2.0 (the Windows equivalent of the forthcoming OpenDoc, or Apple's publish and subscribe) require Enhanced mode—even if you don't need to run OLE 2.0 within your SoftWindows session, you may well want to use OLE to connect a program running in SoftWindows with a program running on a real PC on the network.

Realizing this, Insignia is working on an Enhanced-mode–compatible upgrade to SoftWindows, but that won't be available until the end of the year, at which time the next version of Windows—version 4.0, code-named Chicago—should be close to shipping. People need 486 mode right now, not the end of the year. Insignia says it will be several months after 4.0's release before SoftWindows will be upgraded to support it.

A third price is cost. The $499 list price translates to a street price of about $350. While that's steep for an operating system (Windows 3.1, MS-DOS, and System 7 combined cost less), it's not unreasonable. But SoftWindows requires 16MB of RAM—that's another $350 or $400 for most Power Mac owners. (Why so much RAM? The Mac System takes about 3MB, while SoftWindows' emulation takes about 7MB. That reserves about 5MB for Windows itself and about 1MB for other Mac programs.) And for reasonable performance, you need a cache card in the Power Mac 6100 or 7100—that's another $200 from third-party cache vendors. Quickly, SoftWindows ends up costing you about $900. For a few hundred dollars more, you can buy a PC coprocessor board from Orange Micro (714/779-2772).

SoftWindows supports NetWare, so a Mac running it can be directly connected to a PC network. SoftWindows also runs on all models of the Power Macintosh. (The Orange Micro boards require a Mac or Power Mac with a 12-inch NuBus slot.) Users who won't be performing demanding tasks can run it—at less-than-optimal performance—on a system without a cache, which drops the total cost to about $700.

If you run Windows software occasionally, or run undemanding Windows software a lot—and the Enhanced mode support is not an issue for you—SoftWindows is a viable solution, but no more than that. For more-demanding or long-term needs, however, a hardware solution is a better approach. As Power Macs get faster, so should SoftWindows, but nonetheless, I'm not sold on SoftWindows as a long-term solution to Windows compatibility.—GALEN GRUMAN

Power Mac Update

WordPerfect 3.0a

System Requirements 680X0 Mac: 2MB of RAM, System 6.0.7, 9MB of hard drive space. Power Mac: 4.5MB of RAM, System 7.1.2, 11MB of hard drive space.
Pricing The company's suggested price is $495; current users of WordPerfect 3.0 for Macintosh can upgrade to the Power Macintosh version for $19.95 (basically the cost of the disks), users of WordPerfect 2.X or earlier can upgrade for $89, and users of competing word processors can migrate to WordPerfect 3.0a for $99.
Company WordPerfect Corporation (801/222-5000).

WordPerfect Corporation has wasted no time in shipping the native Power Macintosh version of WordPerfect 3.0. WordPerfect 3.0a has been recompiled to take full advantage of the Power Macintosh features. Both the 680X0 and Power Macintosh versions contain the same feature set and ship on the same set of disks. WordPerfect uses the smart installer, which automatically detects whether a user has a 680X0 or Power Macintosh and installs the appropriate version.

Macworld Lab performed a variety of speed tests using a WordPerfect 508K real-world file. We tested how long it took to open the file; perform a page scroll, find and replace, and word count; and change the font in the entire document. We then averaged the results. Macworld Lab performed these tests on a Power Macintosh 7100/66 with 8MB of RAM and a 250MB hard drive, and for comparison we performed the same tests on a Centris 650 with 8MB of RAM and a 230MB hard drive.

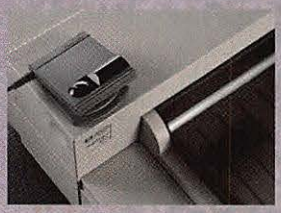
MW LAB

	WORDPERFECT 3.0a	WORDPERFECT 3.0
Power Mac 7100/66		
Native	37.75	
Emulated 680X0		100.84
Centris 650		
680X0		60.88

Average time to perform tests (in seconds).

The Centris 650 outperformed the Power Macintosh 7100/66 using the 680X0 version of WordPerfect. When running software written for 680X0 CPUs, the Power Macs performed at speeds between those of a IIci and a Centris 650, according to our testing. Clearly, no one should buy a Power Mac to run emulated 680X0 software.—LAUREN BLACK

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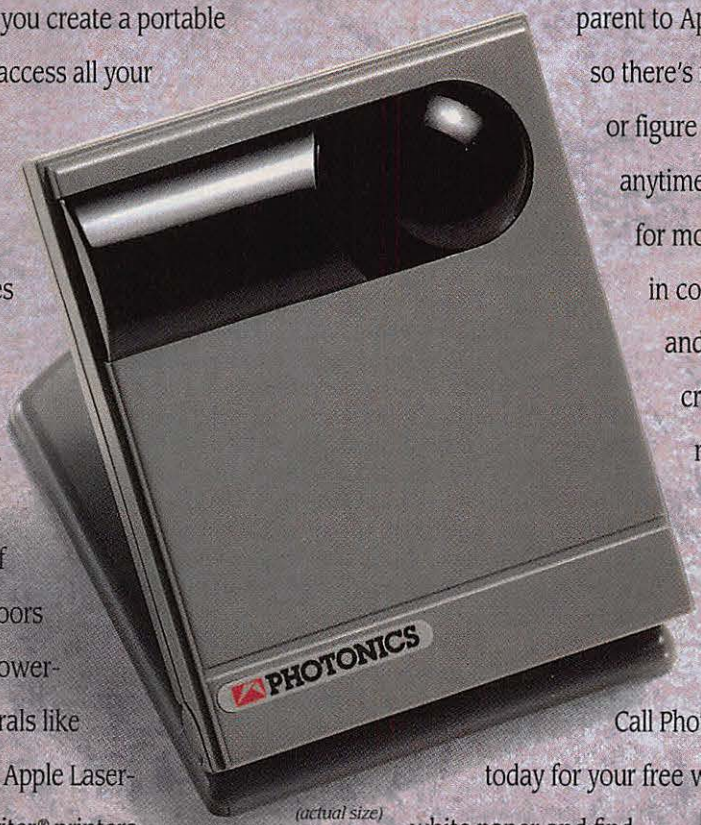
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Circle 298 on reader service card

MetaFlo'

Graphics Utility

PROS: Easy to use; versatile; creates interesting visual effects and animations. **CONS:** Lacks Undo in morphing mode; no automatic save of catalog images. **COMPANY:** The VALIS Group (415/435-5404). **LIST PRICE:** $595.

MW ★★★★

REMEMBER CREATING FUNNY faces by pressing images onto Silly Putty and tugging on it? That's basically the premise of MetaFlo', a graphics utility that yields interesting visual effects with a minimum of fuss.

MetaFlo' imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. For example, you can edit photographs to produce subtle changes, such as widening a smile or thinning the nose on a face. Or you can simply distort the subject matter, as you might to emulate the melting timepieces of Salvador Dalí. When you're done, MetaFlo' renders a new image. And it can save the progression of image changes as a QuickTime movie, making special-effects animation a snap.

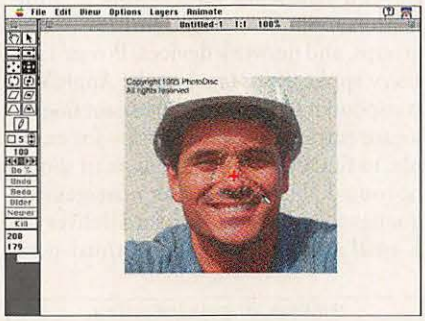
MetaFlo' can juggle several image layers simultaneously to produce complex effects. It accepts both PICT and TIFF files. You can operate tools for scaling, rotating, skewing, distorting, and translating (moving) on the entire image or on user-defined segments. You produce localized distortions by defining a core segment and a surrounding boundary that softens the transition from distorted segments to unaffected areas. And any effect can be modified by a percentage. For example, you can reduce that newly applied smile by 20 percent or further expand a nose by 200 percent.

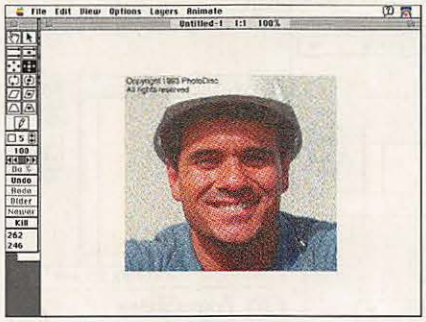
The program's accuracy and flow controls let you fine-tune the interaction of core and boundary pixels. You can adjust the coarseness of core and boundary edges by changing the number of control points in the elasticity-imparting grid used to calculate distortion effects. Higher settings offer more precision but require more calculation time. Still, after all the adjustments, the magic lies in how well MetaFlo' blends the distorted core and boundary with the rest of the image.

When applying multiple transformations, MetaFlo' keeps track of the sequence in hierarchical fashion. Handy palette buttons permit unlimited undoing and redoing of effects, letting you move forward or backward through the hierarchy. For example, you could retreat several steps, alter a distortion's percentage, and reapply the subsequent distortions to produce a different result. Transformation sequences are also stored in the program's native file format, so you can produce variations from completed images or apply the same distortions on a substitute image.

MetaFlo' keeps track of the hierarchy of transformations by letting you put snapshots of the current state of the image into a catalog. The catalog displays thumbnails in a separate window. Catalogs store the hierarchy of distortions, the order of image layers, the weight of each layer's mask, and the distortion percentage. You can jump to any stored snapshot by simply double-clicking on the thumbnail. Unfortunately, you cannot automatically add images to the catalog. If you need a snapshot after each effect, you must conscientiously take each one.

The program's layering ability lets MetaFlo' produce complex visual effects.





Distortion on Command With a bit of practice, MetaFlo' makes subtle photo-editing and large-scale image distortions as easy as click-and-drag.

You can distort layers individually and modulate other properties such as transparency. Each layer can accept a 32-bit image, and MetaFlo' has a pop-up tool palette for producing masking effects.

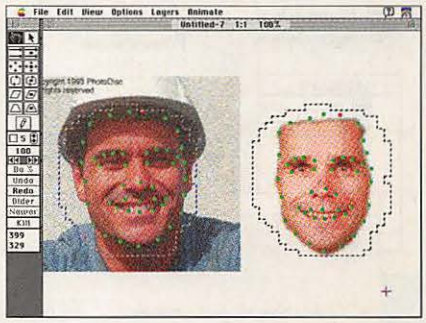
In addition, layering gives MetaFlo' the ability to create two kinds of morphs. The first combines two images by partially distorting each into the other. The result is a blending effect, like a facial composite. The second simply uses one image as a template that governs the distortion of the other. Both produce interesting and useful morphs, but there's no Undo in either morphing mode. If you make a mistake setting control points, you must start over.

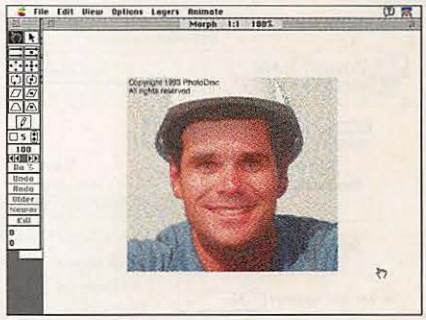
To create animations, you define the distortion steps as keyframes, and MetaFlo' generates the intervening frames. You can set transition smoothness between keyframes as a percentage value, and there's no limit to the number of keyframes and tween frames you can specify. You can define the sequence from the catalog without reapplying the effects step-by-step. MetaFlo' stamps keyframes with SMPTE time-codes and offers a convenient Show KeyFrames feature that simplifies organizing an animation.

When you're finished distorting and transforming, MetaFlo' renders final images that are equal in quality to the original. Sliders let you adjust the sharpness of the image and its alpha-channel mask. Stills can be saved as PICT and TIFF files, and animations, in PICS and QuickTime formats. In prepress environments, an image's CMYK channels can be distorted as individual layers. MetaFlo' uses the values of the input image, preserving color balance.

Beyond the program's obvious uses in image processing, animation, and graphic arts lie other less conspicuous applications, such as cosmetic-surgery visualization. MetaFlo's layering capabilities and interface enhancements make it useful and versatile for professional use.

—CARLOS DOMINGO MARTINEZ





Blended Morphs MetaFlo' produces morphs by combining image layers. The process can be animated as a QuickTime movie.

PowerShare Collaboration Servers

Collaboration Software

PROS: Provides some useful collaborative services. **CONS:** Expensive; weak documentation; confusing and incomplete administration interface; poor troubleshooting aids.
COMPANY: Apple Computer (408/996-1010).
COMPANY'S SUGGESTED PRICE: $999.

MW ★

THE LATEST BUZZWORD IN OFFICE automation is "collaborative computing"—using computers to let people work together from physically remote sites. Proponents of collaborative computing promise to eventually deliver such tools as desktop videoconferencing, electronic whiteboards, real-time document sharing, and virtual meetings. Today, though, collaborative computing boils down to E-mail. With the PowerShare Collaboration Servers package, Apple intends to create a standardized central server environment into which third parties can plug components. The only plug-ins currently available for such a foundation are E-mail gateways; and for straightforward E-mail routing, Microsoft Mail and CE Software's QuickMail are superior. And while PowerShare includes time services, user authentication, and cataloging, the interface to these facilities is confusing and poorly designed.

PowerShare runs as a "headless" application. It has no direct user interface other than an administration tool; instead PowerShare provides server services to other Macs on a network. The package consists of three applications—Catalog Server, Mail Server, and Admin. The two server applications run automatically on start-up, consuming 2MB each, and the Admin application consumes 2MB when you're performing administration chores.

PowerShare provides four services—cataloging, electronic-mail routing, time coordination, and user authentication—in conjunction with PowerTalk software running on client Macs. The services are useful ones. Central time services keep all the clocks of client PowerTalk systems in sync, ensuring that PowerShare correctly replicates centrally maintained catalogs on client machines. The Catalog Server lets you maintain a central store of information about PowerTalk entities—users, groups, and network devices. PowerTalk-savvy applications (such as the AppleMail component of PowerTalk) use catalogs to locate entities on the network—for example, to find a user to whom E-mail should be routed. The Mail Server manages mail queues for store-and-forward delivery of E-mail and lets you snap in third-party external mail gateways. The catalog server also acts as an authenticator—verifying to one client that another client is an authorized user. Some PowerTalk-savvy applications, use PowerShare's authentication services to ensure that encrypted mail goes to the proper destination and to certify that a given encrypted message is from who it says it is.

In principle this is all great. And in practice, the services run as advertised—once you get them configured. But setting up and maintaining a PowerShare server is not a chore for the fainthearted. Configuration, ongoing management, and problem resolution—all things network managers must deal with daily—are odious tasks under PowerShare.

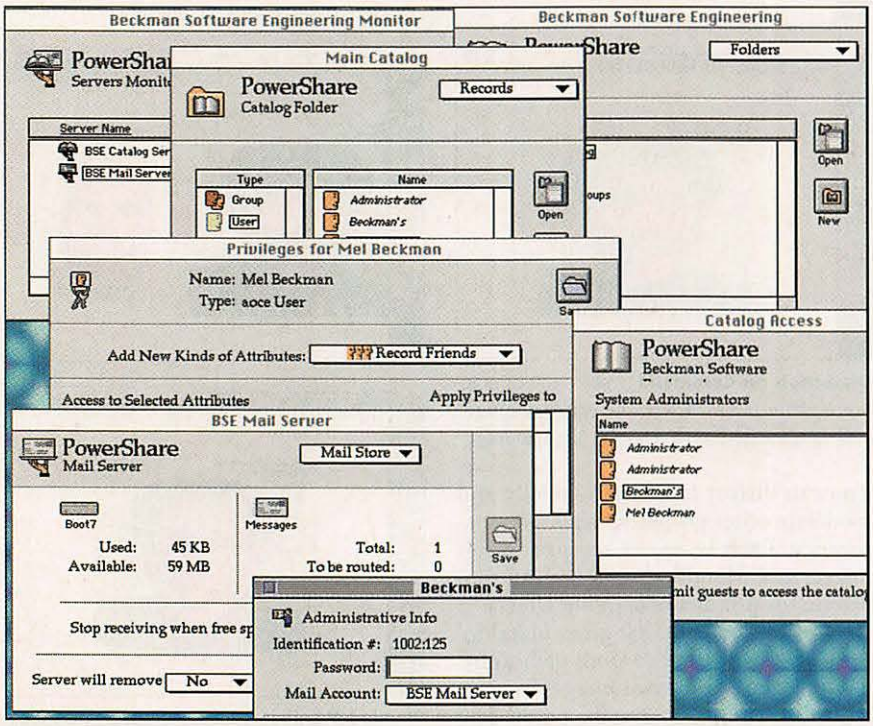
After three days dedicated to PowerShare, I could send mail from one machine to the others but not vice versa. Apple technical support couldn't help. I called ten times; six times I gave up after a minimum of 20 minutes on hold, and four times I actually spoke with Apple tech-support personnel. No one I spoke with had received any training on the product. When I asked how to get better PowerShare support, I was told I could buy a Technical Coordinator Answerline support contract for more than the cost of the software itself! If, after five years of experience as a network administrator, I have this much difficulty, I wonder how less experienced users will fare.

Making sense of Apple's sharp-looking but confusing (and unindexed) manual is anything but painless. The manual is a detailed guide for performing dozens of procedures, with no overview to make the entire process comprehensible.

Besides inadequate documentation, the Admin user interface requires dragging list entries between lists, with no visual cues about when such drags are allowed or what changes they effect. For en route E-mail, Admin shows that the messages are in an E-mail queue, but won't let you view information about the messages—such as the source or destination addresses—that is vital to diagnosing problems. The manual's terse troubleshooting section offers minimal help.

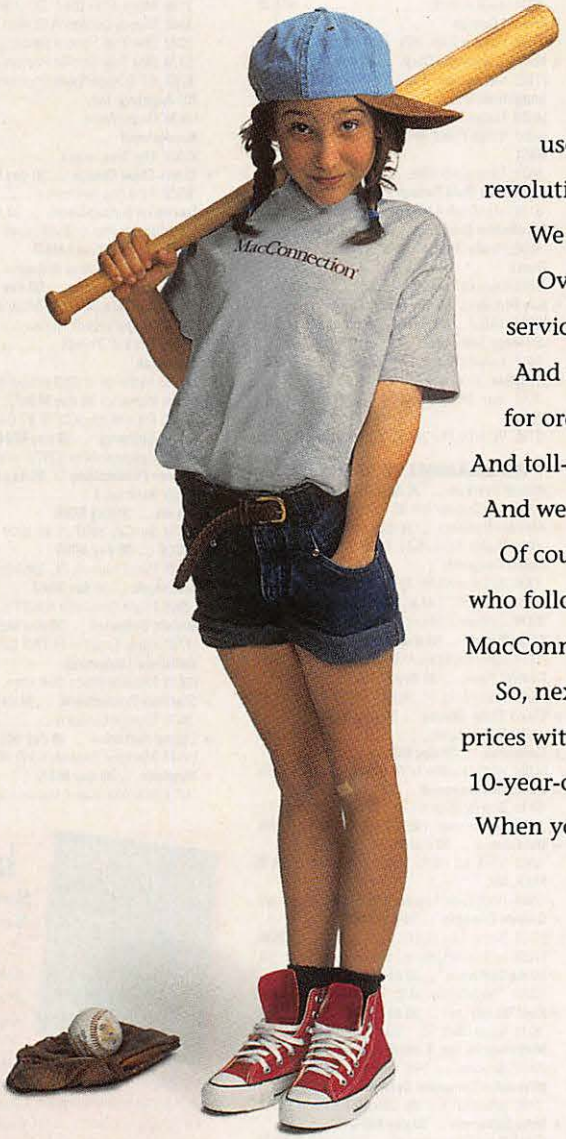
I've no doubt that collaboration computing is in the Mac's future. I also have no doubt that PowerShare, at least in its current form, isn't. Apple needs to overhaul the complex Admin application, add serious diagnostic aids, and provide comprehensive documentation before PowerShare will be ready for prime time.

—MEL BECKMAN



Apple's PowerShare The Admin application presents a bewildering array of windows and dialog boxes. Setting up and maintaining a PowerShare Server is not a task to be taken lightly.

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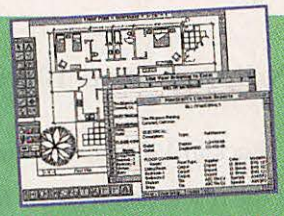
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BUSINESS

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★ **Attain Corporation ... 60 day MBG**
8465 IN CONTROL 3.0 85.
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3836 FileMaker Pro 265. 14732 MWrite Pro 95.
Creative Think
14540 Creative Whack Pack 29.
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12974 DeltaGraph Pro 3 139.95.
15819 DeltaGraph Pro 3 Compet. Upg. ... 79.95
Gold Disk
12279 Astound $249.
★ **Inspiration ... 30 day MBG**
11269 Inspiration 4.0 165.95
★ **Intuit ... 30 day MBG**
11845 Quicken 4.0 39.95
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★ **Microsoft ... 30 day MBG**
2884 Works 3.0 155.95 4902 Word 5.1 295.
3669 Excel 4.0 295. 5454 MS Office 3.0 475.
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1793 Now Up-to-Date 65. 2366 (10 pk.) 519.
14027 Now Up-to-Date & Now Contact 99.95
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★ **ProVUE ... 60 day MBG**
4582 Panorama 249. 11540 PowerTeam 95.
★ **Symantec ... 60 day MBG**
7636 ACT! (contact manager) 169.
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4268 WordPerfect Mac 3.0A 299.95
4711 WP Upgrade (while supplies last) 54.95



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MacDraft 4.0 gives you full-scaled, multi-layered drafting environment with a complete set of sophisticated, yet easy-to-use drawing tools. It features keyboard editing for greater precision and integrated database.

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11548 PageMaker 579.95 10864 Upg. 145.95
15021 Persuasion 324.95 15029 Upg. 145.95
1330 FreeHand 389.95 4728 Upg. 145.95
9229 DateBook/TouchBase Pro Bun. 4.0 89.95
13711 Home Pub. or 3506 SuperPaint ea. 49.95
1306 Paint & Publish Bundle 89.95
Altsys
1195 Fontographer 258.95
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13603 Print Shop Deluxe 49. 3572 Kid Pix 34.
★ **Claris ... 30 day MBG**
14158 Impact 145.95 2518 MacDraw Pro 269.



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Plan smarter with IN CONTROL 3.0. It combines the award-winning Action Outliner with full-featured calendars. Plan, prioritize, and schedule simultaneously.

8465 IN CONTROL 3.0 **$85.**

MDS Hard Drives 30 DAY MBG



Add storage and performance to your Mac with a compact, reliable **MDS Zero Footprint (ZFP) Hard Drive.** They give you acres of data storage without taking up valuable acreage on your desk! And they're easy to install, with no jumpers or DIP switches to set. Features include a sturdy metal case, two SCSI ports (for daisy chaining), two switched AC outlets, and a 2-year warranty. Includes a SCSI system cable and FREE Hard Disk ToolKit Personal Edition formatting software.

15814 270MB ZFP Hard Drive **$349.95**
15813 340MB ZFP Hard Drive **429.95**
11863 540MB ZFP HD **599.95**
15117 1.2GB (Fujitsu) ZFP **949.95**
2219 1.08GB (Quantum) **999.95**

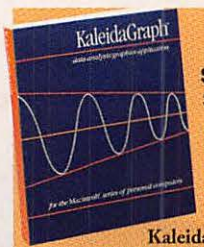
★ **Deneba Software ... 30 day MBG**
11055 artWORKS $99. 3227 Canvas 3.5 $259.
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9034 de-Babelizer 184.95
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9192 MacDraft 4.0 349.95
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7612 QuarkXPress 3.3 589.95
★ **Ray Dream ... 30 day MBG**
12264 JAG II... 89. 4761 Designer 3.0 249.
Synergy Software
6617 KaleidaGraph 149.95
★ **T/Maker ... 30 day MBG**
3144 Incr. Images or 3147 CD-ROM ea. 89.95
Virtus
3185 WalkTh. Pro 249.95 3189 Virtus VR 64.95

PROGRAMMING/UTILITIES

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7410 StuffIt SpaceSav. 34.95 6740 Deluxe 69.
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1206 At Ease 45.95 7072 QuickTime Kit 75.95
1074 System 7.1 44.95 13047 S7 Pro 79.95
10478 System 7.1/Font Pack Bundle 62.
★ **CE Software ... 60 day MBG**
1727 CalendarMaker 39. 7927 QuicKeys 105.
★ **Central Point ... 30 day MBG**
5041 MacTools 3.0 85.95 11812 Upg. 49.95
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8571 Safety Suite 45.95
★ **Connectix ... 30 day MBG**
14789 RAM Doubler or 7830 Maxima 3.0 ea. 55.
★ **Dantz Development ... 30 day MBG**
9115 DiskFit Direct 1.0.... 29. 3393 Pro..... 72.
5255 Retrospect 145. 7945 Remote 2.0 259.
★ **Datawatch ... 30 day MBG**
4803 Virex 5.0 64.95 11486 SuperSet Ut. 94.95
FWB, Inc.
2999 Hard Disk ToolKit 125. 7929 Pers. 49.
★ **Golden Triangle ... 30 day MBG**
11731 TimesTwo (1.44) 49.95
14294 w/TouchBase or 14293 w/DateBook 59.
★ **Inline Software ... 30 day MBG**
15849 PopupFolder 34.95 1740 Redux Del. 49.95
★ **Kent Marsh Ltd. ... 30 day MBG**
9513 FolderBolt 73. 1839 NightWatch II 89.
Metrowerks, Inc. CodeWarrior
15444 Bronze..... 199. 15446 Gold 399.
MicroMat Computer Systems
3732 MacEKG II... 89. 2998 DriveTech 42.
★ **Now Software ... 30 day MBG**
12303 Now Compress 46. 12304 FUN! 29.95
6925 Now Utilities 4.0 84.
★ **Symantec ... 60 day MBG**
3955 Suitcase 53. 14244 SuperDoubler 79.95
5176 SAM..... 65.95 6748 NUM 95.

EDUTAINMENT/GAMES

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5737 After Dark 2.0x (30+ screens!) $39.
2198 More After Dark 25. 2196 Bun..... 39.95
1502 Disney Collection Screen Saver 29.
3392 Star Trek Screen Saver 29.
5179 Star Trek Screen Posters 29.
5262 ST Screen Saver/Posters Bundle 39.
Bit Jugglers, Inc.
14676 UnderWare 29.95
Broderbund
13601 The Treehouse 36.
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9322 Amazing Animation 39.95
★ **Davidson & Associates ... 30 day MBG**
MathBlaster Plus or ZooKeeper ea. 34.95
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13714 Eric's Ultimate Solitaire 36.95
★ **Edmark Corporation ... 30 day MBG**
7155 Kid Desk 24. 7318 Millie's Math Hse. 29.
1078 Bailey's Book House 29.
12989 Thinkin' Things 39.
GameTek
13813 Jeopardy or 7433 Wheel of Fortune 24.95
★ **Great Wave ... 30 day MBG**
6693 Kid's Math or 2276 KT Deluxe ea. 27.95
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9792 Deliverance or 9797 Firefall Arcade 29.95
★ **Leister Productions ... 30 day MBG**
7126 Reunion 3.0 115.
★ **Maxis ... 30 day MBG**
13818 SimCity 2000 39.95 5279 Classic 24.95
★ **MECC ... 30 day MBG**
3959 Word Munch 19. 3963 Oreg. Trail 29.95
★ **Microsoft ... 30 day MBG**
2868 Flight Simulator 4.0 (CP) 42.
Nordic Software ... 30 day MBG
7723 Lang. Explorer or 7767 ClockShop ea. 29.
Software Toolworks
15815 Miracle Piano Software 84.95
★ **StarPlay Productions ... 30 day MBG**
3675 Crystal Caliburn 33.95
★ **Upstill Software ... 30 day MBG**
14140 Mangia! (includes 340 recipes) ... 33.95
★ **Voudette ... 30 day MBG**
4764 FLOWERscape (garden planner) 48.



30 DAY MBG

Synergy Software

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6617 KaleidaGraph .. **$149.95**

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13509 MYST 49.95
★ **Claris Clear Choice ... 30 day MBG**
13907 From Alice To Ocean (book w/CD) 46.95
Compton's
2314 Interactive Encyclopedia 79.95
FWB, Inc.
10198 CD ToolKit 49.
★ **Microsoft ... 30 day MBG**
1741 Music. Inst. or 6759 Cinem. '94 ea. 54.95
14913 Art Gallery or 14914 Dinosaurs ea. 54.95
8517 Booksh. '94 62.95 6943 Encarta '94. 89.95
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Full line of great CD-ROM images call
Presto Studios
11330 The Journeyman Project..... 44.95
★ **Spectrum Holobyte ... 30 day MBG**
1485 Iron Helix..... 59.95

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3561 QuickTake 100 Camera..... 689.95
★ **Coda Music Technology ... 30 day MBG**
5604 Finale 3.0 549. 12307 F. Allegro 259.
★ **Great Wave ... 30 day MBG**
1014 ConcertWare Pro 1.0 129.95
Macromedia
5087 Director 4.0 849.95
Noise Cancellation Technologies
4919 Noise Buster 119.95
Nova Development
11101 Kaboom! 29. 12278 w/More Kaboom 40.
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1738 PrecisionColor Pivot (req. interf.) 879.95
14597 PhotoBooster 799.95
RasterOps PaintBoard Series Display Cards
14750 Lightn. 24-bit 849.95 12909 Turbo XL 1199.
Sony Multiscan Trinitron Monitors
10529 CPD-1730 17" 1039.
11810 Multiscan 15" SF 499.95
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12704 20"+Col. 1849. 10321 Col. Pg. T16II 1299.
10322 Presenter 449.95
8005 Ultura LX 1199. 7985 EtherDock 649.



Berkeley Systems

Delight in the magic of Disney with all your favorite characters in **The Disney Collection Screen Saver. After Dark** is the classic screen saver, with more than 12 displays with sound.

1502 Disney Collection Screen Saver **$29.**
5737 After Dark **29.**

COMMUNICATIONS

Apple Computer
7073 Mac PC Exchange..... $59.
14231 Remote Access 2.0 Client for Mac 54.95
Asanté Technologies, Inc.
2775 10/T Hub-8 249. 2772 10/T Hub-12 499.
CommForce
15862 4-Sight 599.95
★ **CompuServe ... 60 day MBG**
1676 Membership Kit 25.
★ **DataViz MacLink Plus ... 60 day MBG**
1823 PC Conn. 7.5 129. 12093 Tran. Pro 7.5 95.
★ **Dayna ... 60 day MBG**
11878 DOS Mounter Plus..... 54.95
8719 EtherPr. or 9888 (10BASE-T) ea. 339.95
★ **Delrina Technology ... 60 day MBG**
10080 FaxPRO for Macintosh 1.5..... 79.95
★ **Farallon Computing ... 30 day MBG**
11499 EtherWave AAUI Transceiver..... 109.
4869 PhoneNET Connector 10-Pk (DIN8) 195.
14545 Timbuktu Pro 135. 4866 Remote 129.

MDS Removable Drives



MDS Removable Drives (20ms average access time) include FWB's Hard Disk ToolKit PE. Plus free Atticus Vista!

30 DAY MBG

15097 MDS 44MB (w/out cart.)..... **$239.95**
15802 MDS 88MB (without cartridge) **299.95**

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14804 Second Sight..... 119.95
★ **Global Village ... 30 day MBG**
7889 TelePort/Bronze II 95. 2179 Gold 299.
Hayes
10822 ACCURA 2400 74.95 11422 96 Fax 159.95
11419 ACCURA 144+Fax144..... 169.95
Insignia Solutions
7557 AccessPC 3.0 85.
4089 SoftPC... 109. 10554 SoftPC Pro 215.
4433 Soft Windows for Power Mac..... 289.
★ **Practical Peripherals MCs ... 30 day MBG**
4885 288MT II V.FC 309.95 4879 144 154.95
Shiva
6555 LanRover/L..... 599.
14837 NetModem/E..... ea. 1479.
★ **Software Ventures ... 30 day MBG**
1964 MicroPhone II 109. 3455 Pro. 139.95
Sonic Systems
Ethernet Adapters (various)..... call
★ **STF Technologies ... 30 day MBG**
7639 FaxSTF 3.0..... 39.95
★ **SupraFAXModems ... 30 day MBG**
5337 FaxModem 144LC 164.95
2413 28.8K Modem+14.4K Fax..... 309.95
★ **Synergy ... 30 day MBG**
6618 VersaTerm 5.0 119.95 6619 PRO 169.95
U.S. Robotics
11842 Sportster 14.4 Mac & Fax..... 169.95

★ **Zoom FaxModems ... 30 day MBG**
7757 AFX... 69.95 15895 VFX 28.8..... $239.95
3553 FaxModem VFX V.32bis 149.95
14152 FaxModem VFX 14.4V (Voice)..... 174.95

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Apple Computer
3443 Power Macintosh Upgrade Card 649.95
★ **DayStar Digital ... 30 day MBG**
15782 Turbo 040 40MHz & 128K Cache 1049.
15924 80MHz Pow. Pro 601 for Pow. Mac 2149.
FWB, Inc.
14321 PE 170 409.95 14322 PE 340 FMF 579.95
14318 PocketHammer1000FMF 1349.95
IOMEGA
8781 Mac Transportable 90 PRO..... 369.
10499 Transportable MultiDisk 150..... 479.
Mobius Speedster 040 Accelerators
15189 AC433i 33MHz w/128K Cache..... 489.
15191 AC433f 33MHz FPU w/128K Cache.... 689.
Peripheral Land (PLI) full line available
11470 Infinity 88/RW 44..... 549.

INPUT/OUTPUT

★ **Adesso ... 30 day MBG**
15456 Extended Mac Keyboard..... 79.95
15457 ADB Mouse 39.95
★ **Advanced Gravis ... 30 day MBG**
1482 Game Pad 39. 9963 MouseStick II 65.95
Apple Computer
3560 LaserWriter Select 360..... 1499.95
3475 Personal LaserWriter 320 899.95
3461 StyleWriter II 289.95
3479 Color StyleWriter Pro 599.95
Caere
4930 OmniPage Pro 5.0 489. 7705 Direct 89.95
7925 OmniScan 299.95
Epson
8194 Action Scanner (ES-600C SCSI) 869.95
★ **GDT Softworks ... 30 day MBG**
2499 PowerPrint 99.95 12717 PP. NW 329.95
Hewlett-Packard
14689 ScanJet 2CX..... 999.95
15859 DeskWriter 520 289.95
Interex Computer Products
12862 105 Key Deluxe Keyboard 99.
★ **Kensington ... 60 day MBG**
2547 Turbo Mouse 4.0 ADB..... 107.
★ **Microtek Labs, Inc. ... 30 day MBG**
13815 ScanMaker IIg 479.95 13814 IIsp 749.95
1688 ScanMaker III 2359.95 1693 IIhr 1029.95
★ **Mouse Systems ... 30 day MBG**
7520 Little Mouse ADB 59.95 8001 Plus 29.95



MDS 14.4 FaxModem

Hayes compatible V.32bis/V.42bis 14,400bps send/receive fax and data transmission. Includes all necessary cabling and data/fax software.

8478 MDS 14.4 FaxModem..... **$139.95**

Mobius Technologies



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15189 Speedster 040 Accelerator 33MHz w/o FPU **$489.**
15191 33MHz w/FPU..... **689.**
15190 40MHz w/FPU..... **869.**

★ **Sophisticated Circuits ... 30 day MBG**
8009 PowerKey 75.95 8008 Remote.. $32.95
★ **Texas Instruments ... 30 day MBG**
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13659 microLaser Pro 600 PS65 1599.
★ **UMAX Scanners ... 30 day MBG**
13748 UC630 689.95 13751 UC1260 1149.95
WACOM
11259 ArtZ 6X8 Tablet 325.95
Xerox
15345 TextBridge 74.95

ACCESSORIES

Apple Computer
11663 StyleWrit. II Cart. 23. 11669 (3 pk.) 63.
LaserWriter Toners: Pers. 65. LW II 85.
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14018 Tote.... 35.95 9585 Executive 115.
★ **Targus Cases... 60 day MBG**
7369 Notepac... 35.95 1305 Universal 69.
13941 Business Commuter Case..... 114.95

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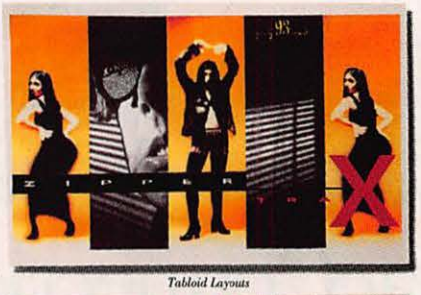
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Now isn't it time you got the big box of crayons?

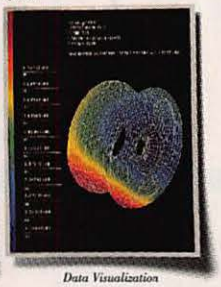
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Tabloid Layouts



Business Graphics



Data Visualization

The new Phaser 300 can print a full bleed 11"x17" page on nearly any kind of paper in two minutes. Think fast.

Tektronix

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Circle 143 on reader service card

OneWorld Fax

Fax Server

PROS: Entire office can share fax modems; easy to set up and configure. **CONS:** Cannot receive faxes; cannot queue more than one fax document at a time from a single CPU. **COMPANY:** Global Village Communication (415/390-8200). **LIST PRICE:** $999; two-line server and two PowerPort Bronze II modems $1499.

MW ★★★

FAX MODEMS ARE ONE OF THOSE technological advances that make our working lives easier. Unfortunately, technology is expensive, and putting a fax modem on everyone's desk adds up quickly.

Global Village's solution, OneWorld Fax, is one of the easiest network-fax products to install and use. It has limitations, but it lets an office share fax-sending resources without dedicating a hard drive and CPU to the process, which is a benefit that few other network-fax products offer.

The OneWorld Fax is about the size of a package of Oreo cookies. It's configured with one or two Global Village PowerPort Bronze II fax modems (supporting 2400-, 4800-, and 9600-bps fax-transmission rates) as well as connections for a 10BaseT and a LocalTalk network (you can use only one network type at a time).

Installing the hardware involves plugging three cables into the back of the unit—that's it. The next step is to configure the server with the administration software provided. Configuration includes setting up users and passwords as well as establishing a priority-fax threshold (shorter faxes are placed ahead of monolithic documents). The threshold length can be configured on a user-specific basis or for all users.

You must install GlobalFax software on all client Macs; it lets clients send faxes and choose the OneWorld server (more than one OneWorld server can exist on a network but they cannot be linked together). OneWorld comes with a license for 30 users. Additional user licenses are available.

The GlobalFax software that ships with OneWorld has a window in the Fax Center that allows you to monitor the progress of faxes in the OneWorld fax queue. Document icons represent faxes in this window; dots mark the faxes that belong to you.

Several volunteers installed the GlobalFax software, and we had them send multiple faxes to see how the product performed. Overall, the product performed quite well. Most users were familiar with the software and had little difficulty selecting the server and sending a fax document. The priority faxes did as promised and skirted right past a few large fax transmissions.



RICHARD RETHEMEYER

We discovered that the fax server cannot queue multiple fax transmissions from a single user, even for group address-book entries. In other words, if you're trying to send out more than one fax, OneWorld can't queue the second document until it has sent the first one. Also, users cannot access both fax lines simultaneously; this is a limitation of the GlobalFax software and not the server. Global Village is currently debating whether to add multiple data streams to future revisions of the software. We all vote yes!

Network faxing is a timesaving, cost-effective way to reduce expenses. Other products exist to send faxes, but Global Village has a product that's easy to install and use at a price that won't knock a hole in your bottom line.—MATT CLARK

ProFiles 1.0

File-Management Utility

PROS: Keeps track of related files and folders; includes synchronization, compression, and expansion. **CONS:** High memory requirement; some file attributes appear only in pop-up lists; cannot display file contents. **COMPANY:** Dayna Communications (801/269-7200). **LIST PRICE:** $129.

MW ★★★

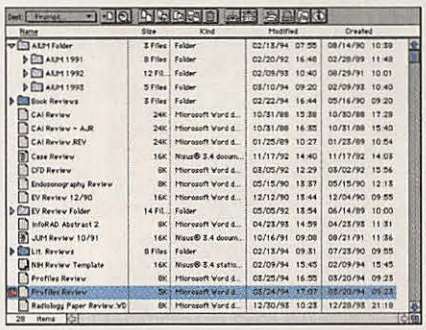
PROFILES IS AN UNUSUAL NEW UTILITY that lets you group related files and folders for quick access. Unlike programs that present a continually updated view of a volume's directory, ProFiles displays an empty file list: you have to add items to the list either manually by selecting them one at a time from a standard Open File dialog box, or automatically, using ProFiles' Find command. File lists can include volumes, folders, and files in any combination (see "ProFiles List"). You can view a folder's contents by clicking on a tiny triangle next to its name, just as you do with the Finder.

ProFiles' Find function works like the Finder's but is more comprehensive. You can specify up to three different search criteria (which you can save for later use), look for aliases whose original items have been deleted, or scan for files that contain a specific string of text. ProFiles' file list is also more functional than the Finder's in several respects—for example, you can view modification and creation dates, path names, and invisible files. But ProFiles only lets you display a file's type, creator, and version by ⌘-clicking to the left of the file name, and you can't edit any of the information in the list.

ProFiles provides an extensive suite of actions you can perform on files and folders. In addition to mundane functions such as copying, moving, and printing, you can create aliases, move items to the desktop, and turn sharing on and off. You can also compress or expand selected items by using an algorithm that you select in the preferences dialog box—ProFiles ships with Aladdin Software's StuffIt engine but also supports Symantec's AutoDoubler and DiskDoubler.

Because ProFiles can save file lists and can reference items on local or remote volumes, the program is useful for people who share files over a network. If you try to open an item on an unmounted disk, for instance, ProFiles attempts to load the correct volume for you—even logging on to a remote network with Apple Remote Access, if necessary. If you work with more than one Mac, ProFiles' synchronize function lets you update two folders so they both contain the most recent versions of files.

Unfortunately, ProFiles doesn't take the place of some of my favorite utilities. For example, PrairieSoft Software's DiskTop is faster for routine copying jobs, and



ProFiles List The icon to the left of ProFiles Review in the file list shows that the volume isn't currently mounted.

I still need a DA like On Technology's On Location to examine a file's contents. Also, ProFiles' recommended RAM allocation of 1MB may be a problem for computers with limited memory (however, it uses only 384K of disk space). Still, ProFiles is worth considering if you have to keep track of associated files and folders scattered over a network.—FRANKLIN N. TESSLER

Circle 78 on reader service card

Mac-to-TV Converters

Video Adapters

L-TV Portable

PROS: Includes all cabling; sturdy; inexpensive. **CONS:** Some flicker and distortion. **COMPANY:** Focus Enhancements (617/938-8088). **LIST PRICE:** $299.

MW ★★★

The Presenter Plus Mac/PC

PROS: All cables included; supports Macs and PCs. **CONS:** Fit TV feature sometimes cuts off menus; murky focus; screen flickering. **COMPANY:** Consumer Technology Northwest (503/643-1662). **LIST PRICE:** $429.

MW ★★★

FOCUS ENHANCEMENTS AND CONsumer Technology Northwest now offer small, external TV-converter units that plug directly into your Mac's built-in video port and convert the Mac's video output to NTSC. These portable devices make using a TV as a Mac display easier than ever, but frankly, they don't deliver the same results as the NuBus and PDS cards designed for Mac-to-TV output.

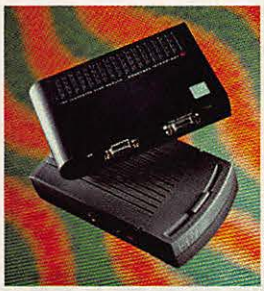
The Presenter Plus Mac/PC

This compact unit supports output to television from most Macs with built-in video—all Quadras and Centrises, the LC series, and those PowerBooks equipped with external video ports. Though you can use The Presenter with the IIvx and IIvi, it doesn't work with a IIci or IIsi.

The Presenter is a black plastic box slightly smaller than a Newton. The 26-ounce unit connects to a TV or VCR via either a composite-video or an S-Video cable (Consumer Technology supplies both). The unit operates from a 9-volt external power supply and includes an AC adapter. You must snap on a Mac adapter (also supplied) to use the included DB-15 computer cable. The cable works, but the adapter makes it hard to attach the cable snugly to the video port; a genuine Mac cable would be nicer. A second video port allows you to attach a VGA monitor to The Presenter along with the TV for dual output.

The device comes with a system extension and a bare-bones control panel designed primarily to fit your Mac's screen within a television monitor. You can activate this Fit TV feature by holding down the T key during start-up. Unfortunately, the software sometimes doesn't do the job. In my tests, the edges of the screen got cut off when I connected my TV to a Quadra 700 and an LC. In one case, the Apple and application menu icons were off screen—though the menus became visible when I clicked in the appropriate corner. To avoid this, you can type a specific resolution into the control panel, choosing a size that will place your desktop well within the bounds of the TV.

The Presenter's antiflicker hardware does a barely passable job of providing a stable image on the television screen; flickering persists, and the image is generally fuzzy and poorly focused.



KEVIN CANDLAND

The Presenter Plus (top) and the L-TV Portable (bottom)

L-TV Portable

The L-TV supports the same Mac models as The Presenter, offers both composite-video and S-Video connections to a TV or VCR (all cables included), and has an additional port for simultaneous output to a VGA monitor. Both devices support cross-platform use and are lightweight and compact enough to travel with a PowerBook. However, the less-expensive L-TV feels sturdier. It comes with its own stand and ships with separate Mac and PC cables. The unit is housed in a slate gray case to match PowerBooks.

The L-TV's screen-fitting features are built into the hardware and are activated by DIP switches. An optional system extension is included to squeeze the Mac's screen to the TV's proportions if the hardware system fails to accommodate your Mac-to-TV configuration.

Unfortunately, like The Presenter, the L-TV failed to provide high-quality output via a composite-video connection. The unit provided a crisper, cleaner image, but mild flickering and conspicuous shimmers were still persistent. When I activated the device's picture-stabilizing feature, the picture improved, but the menu bar became distorted despite the screen-squeezing software.

In the end, I preferred the L-TV's sharper (but slightly less stable) image to The Presenter's murkier output. The Focus package is more solid as a whole.

—JOSEPH SCHORR

Mac-to-TV Cards

Internal Video Adapters

L-TV Pro NuBus

PROS: Supports wide range of Macs; displays up to 32,768 colors at 640-by-480-pixel resolution. **CONS:** Some flicker and distortion despite flicker-filtering software; can't switch between PAL and NTSC modes; cables not included. **COMPANY:** Focus Enhancements (617/938-8088). **LIST PRICE:** $399.99.

MW ★★★

Simply TV

PROS: Diagnostic software included; impressively flicker-free image; supports both S-Video and composite-video connections. **CONS:** Screen mirroring degrades performance; no documentation on diagnostic software; resolution limited to 256 colors. **COMPANY:** E-Machines (408/541-6100). **LIST PRICE:** $439.

MW ★★★

AS A RULE, TELEVISIONS MAKE POOR computer monitors; colors aren't very accurate on an ordinary TV screen, and the resolution is relatively crude. Still, for certain applications—children's games, slide presentations, Mac training programs—a television can be useful as a low-cost display device. E-Machines and Focus Enhancements now offer PDS and NuBus video cards that convert your Mac's RGB video signal to NTSC (the U.S. television standard) or PAL (the European standard) so you can use your Mac with a television or VCR.

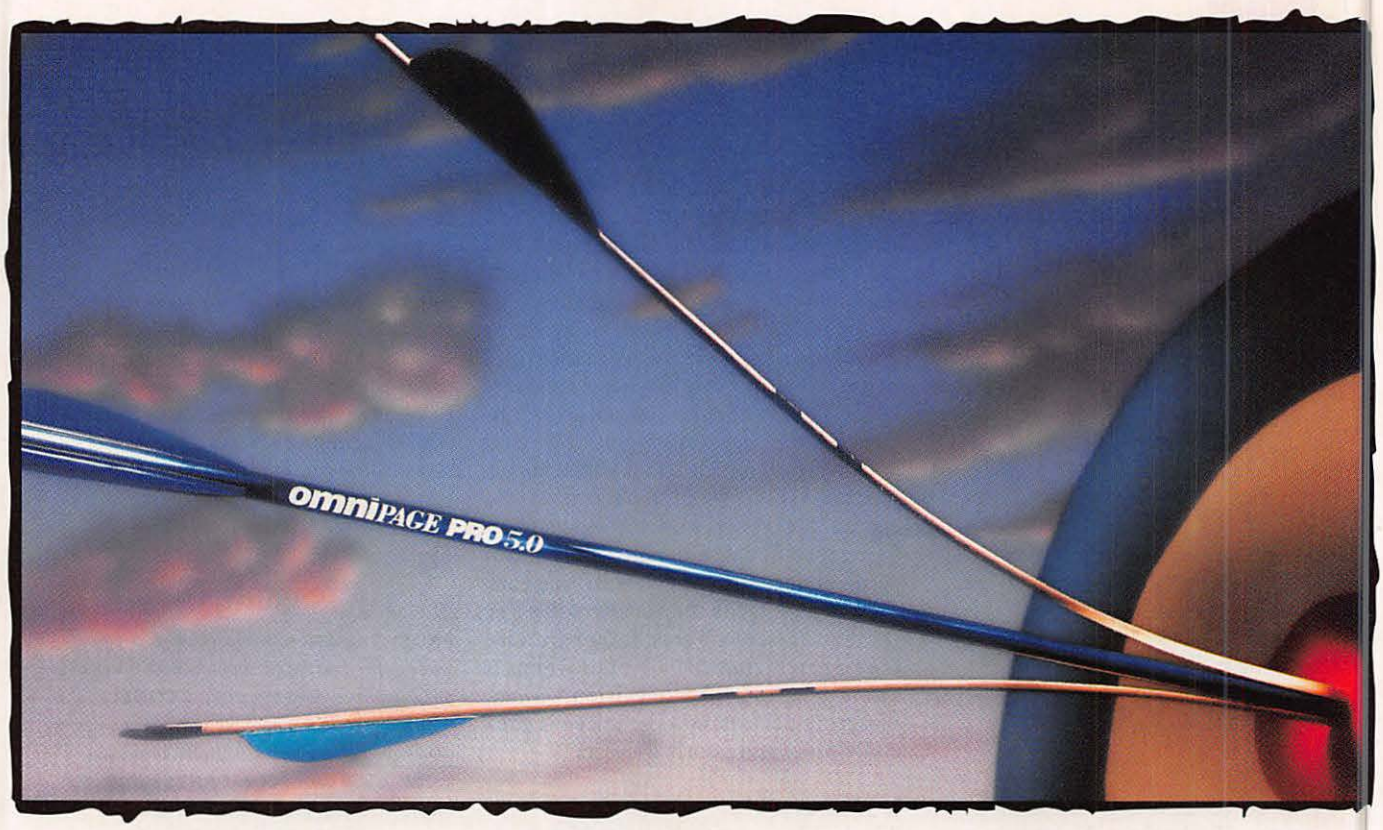
Simply TV

The Simply TV is an easy-to-install video card that plugs snugly into the Processor Direct Slot (PDS) of any Color Classic, LC-series, Quadra 605, or Performa-series Mac. The Simply TV documentation promises you'll be up and running in five minutes—and it's absolutely true.

The card has two jacks: one for the standard composite-video cable that connects to most VCRs with an RCA-plug video-in jack, and one for televisions that support higher-quality S-Video input. A composite cable comes with the package; you simply plug one end into the card itself and the other end into the video-in port on your VCR or television.

The Simply TV's accompanying software is also very easy to use. A control panel includes two useful features: Safe-

continues



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Circle 69 on reader service card

Title ensures that the Mac's menu bar won't be cut off on the TV screen; and Flicker-Free does a fine job of providing a stable, smooth image on screen with minimal flickering and bleeding. The control panel also supports screen mirroring, which makes the TV display the same image as the primary monitor. Mirroring, however, noticeably slows down performance and degrades the speed of screen redraws. A utility, Diagnostics, isn't needed to use the Simply TV, but it provides test patterns and color bars you can use to color-calibrate your TV.

L-TV Pro NuBus

Focus Enhancements' L-TV Pro is a NuBus version of Lapis Technologies' original L-TV card, which was specifically designed for the PDS slot of LC-series Macs. The beefed-up L-TV Pro NuBus supports a wider range of Macs than the Simply TV, including the Mac II series, the Performa 600, the Centris 650, and the Quadra family. (Focus also has a smaller, 7-inch version for use in the Centris 610.) PDS versions of the card are still available for use with the Color Classic, LC series, and Performa 400 series.

The L-TV Pro offers up to 32,768 colors at standard-size 640-by-480-pixel resolution. Like the E-Machines card, the L-TV allows you to record output to a VCR, or display directly to a television via either a composite-video connection or S-Video connector. The L-TV does not come with cables; you must buy your own or get a $50.99 cable package from Focus.

The TV Show software allows you to use the television as a second display or to mirror your primary display. The easy-to-use control panel also provides flicker filtering to stabilize the screen image.

The two cards perform comparably. Overall, I found that the Simply TV provided a somewhat more stable image than the L-TV card, which, despite its flicker-reducing features, displayed an image that sometimes shimmered noticeably. Also, though you probably won't need a card that supports anything but NTSC in the United States, the L-TV Pro doesn't switch between NTSC and PAL, as the Simply TV does; a different L-TV card is necessary for use with PAL.

Of course, whichever card you use, the results are going to be less than gorgeous. Menu commands, for example, are hard to read on a television. And you can't expect anything more than an approximate match of the colors you see on a monitor. But for presentations and applications that don't require high-resolution images or small text, a television and a converter-equipped Mac are a respectable combination.—JOSEPH SCHORR

SupraFaxModem 288

Fax Modem

PROS: Ultrafast file transfers; good fax software. **CONS:** 28,800-bps connections difficult to achieve; will need hardware update when V.34 standard is final. **COMPANY:** Supra Corporation (503/967-2410). **LIST PRICE:** $349.95.

MW ★★★★

SUPRA IS PAVING THE WAY FOR LIFE in the fast lane with its new line of 28,800-bps modems. Even though the new ITU-TSS V.34 modem standard has yet to be finalized, Supra has based its new product on a chip set from Rockwell that supports V.Fast, a preliminary version of the new modem standard. Since other manufacturers are using the same chip set, you should be able to find someone to connect with at the modem's maximum speed if you look hard enough. The modem also supports existing modem speeds from 14,400 bps on down; fax capability maxes out at 14,400 bps.

From a distance, the SupraFaxModem 288 looks like other desktop modems from Supra. Only the "288" label and the small print referring to 28,800-bps data reveal the product's true colors.

The Supra modem ships with PSI's Faxcilitate software, which packs all of its features into a convenient pull-down



RICHARD RETHEMEYER

menu that you access from the menu bar. You can send faxes to a single location, broadcast them to a group of recipients, and defer transmission to a preset time. When sending or receiving a fax, you get a full status report from the FaxActivity desk accessory. Although printing faxes is not automatic, it is fast. Just open the In Basket from the Fax menu, click on the appropriate fax entry, and choose the Print command. In my tests, faxes were clear and sharp and printed in seconds.

Although fax software is notorious for causing a litany of extension conflicts, I found Faxcilitate to be basically trouble-free, even when used on my new Power Macintosh. The only features I miss are the ability to print a fax automatically after it's received and an OCR engine to convert faxes into editable text.

The communications software, MicroPhone LT from Software Ventures, is the same basic application as MicroPhone II and MicroPhone Pro, but it doesn't let you create your own scripts. It does work with scripts created by the other versions of MicroPhone, though. The package ships with scripts for online services such as CompuServe and GEnie, and for Software Ventures' own BBS, should you need technical support.

Supra has clearly learned some lessons. The SupraFaxModem 288 has none of the shortcomings of the older V.32bis model, which had occasional speaker failures early in its production cycle and required several ROM upgrades to fix connection problems. I connected to a variety of online services and BBSs during my testing and had almost no difficulty getting a reliable hookup. Though full 28,800-bps service was hard to come by, I did achieve consistent 24,000-bps connections with Supra's own BBS. Unfortunately, the quality of local phone lines is going to be a limiting factor in supporting the new modem speed. One hopes the ITU-TSS can provide additional methods to handle difficult connections when the V.34 standard is ready.

Supra's own ROM upgrades can be done via its flash ROM and will be available for downloading from the company's BBS or on disk. Doing a ROM upgrade yourself involves running a program that downloads the software directly to the modem—a process that takes three to five minutes. But when the V.34 standard is final, the modem's data pump (processing engine) itself will have to be replaced. That will require returning the modem to the factory for installation, or swapping it for another unit. The initial price will be $69, but if you're willing to wait a few months for chip supplies to increase, the price will go down to $49.

Despite my difficulty in finding places to connect to at its maximum speed, the SupraFaxModem 288 is a very good performer, as good as or better than 14,400-bps modems I've tried, and the price of admission isn't terribly steep. Combined with fast, stable fax software and a good terminal program, it's hard to beat.
—GENE STEINBERG

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Randy Smith

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Design & Layout 1 Video	**MacWrite Pro 3 Videos**	**SuperPaint 3 Videos**
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DiskDoubler 4.0

File-Compression Program

PROS: Compresses and expands files faster and tighter than rivals; files can be dragged among archives. **CONS:** Lacks many great features of previous versions; archives incompatible with previous versions; outrageous phone-help price. **COMPANY:** Symantec Corporation (503/334-6054). **PRICE:** $79.95.

MW ★★★

THE ORIGINAL DISKDOUBLER (DD) could compress files into a disk-space–saving format faster and more tightly than its competition. And DD was breathtakingly simple to use. You highlighted a file's icon and chose Compress from the DD menu in the Finder. A simple double-click sufficed to both expand and open a DD file. But it didn't take long for rivals StuffIt (Aladdin Systems) and Now Compress (Now Software) to duplicate DD's Finder-menu interface—and its compression efficiency. The world waited: would 4.0 again set DD in the forefront?

In pure efficiency terms, yes. DD has five compression settings, three of which are new. The default, DD1, compresses by a few percentage points faster and tighter than other programs. Other options strike different positions on the speed-and-tightness trade-off scale. For example, the AD1 setting compressed my test files in one-sixth the time of StuffIt, but it compressed them only half as much. At the opposite extreme, the DD3 setting crunches files to an average of 40 percent of their original size, but it takes a third longer than StuffIt to do the deed. You realize the most dramatic speed gains, however, when expanding DD's files; regardless of the compression setting, DD files decompress about twice as fast as StuffIt or Now Compress.

DD can also open or convert StuffIt files. (StuffIt, on the other hand, can open a long list of Mac and IBM compression formats.) Unfortunately, the three new DD 4.0 file types can't be opened by older DD versions. Better send the free DD Expand 4.0 program to all your digital correspondents, or you'll be stranded on an island of incompatibility.

DiskDoubler also now offers archiving, which lets you compress multiple files into a single icon. Using a clever Finder-like interface, you can add files to, remove files from, or move files among archives, simply by dragging icons. Alas, you must do all this from a separate application; for the first time, DD users have to step out of the Finder's familiar bounds.

Unfortunately, what you notice most about the new DiskDoubler isn't what's new. It's what's missing. You can no longer add passwords to self-extracting files. You can no longer opt to recompress files automatically. The Skip button (when compressing a group of files) is gone. The Verify/Repair program (helpful for inspecting flaky archives) is no longer included. Gone, too, is Fifth Generation's toll-free help; instead, Symantec charges $25 per call after 90 days.

Symantec also removed the most loved feature of all: DD's ingenious ability to expand *and* open a compressed file with a double-click. You must now double-click once to expand a file, wait, and then double-click again to open it.

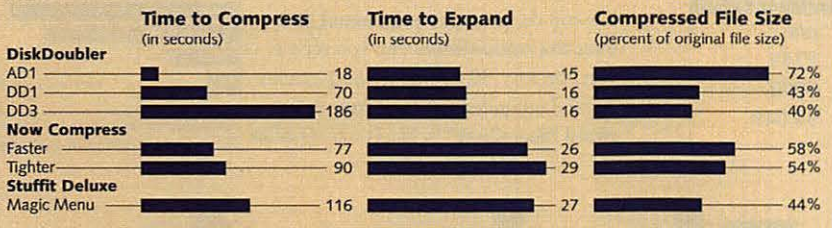
Fortunately, DD users' venomous response to the 4.0 "downgrade" has had a salutary effect: the company finally promised to restore the auto-open feature in version 4.1, projected to be available in mid-June.

When that day arrives, DiskDoubler again should become the most elegant, efficient, easy-to-use file-compression program available. Fie on thee, Symantec, for stripping DiskDoubler of its original flexibility and charm—but blessings on thee for putting the best of it back.

—DAVID POGUE

How Does DiskDoubler Compare?

Smaller bars are better.



BEHIND OUR TESTS Tests were conducted on a Quadra 800, with Verify Writes off. Files included a QuickTime movie; an application; a FileMaker Pro database; font, music-notation, text, PICT, and 24-bit TIFF files; and Excel, FreeHand, PageMaker, and Word files.

Full Contact 2.01

Personal Information Manager

PROS: Object-oriented database heart leaves flat-file and relational engines in the dust. **CONS:** Makes managing your personal information a full-time job. **COMPANY:** FIT Software (408/562-5990). **LIST PRICE:** $169.

MW ★★★

THE PERFECT PIM? IMAGINE A VIRtual secretary on speed, filing and cross-filing all your data so that you could instantly retrieve every phone conversation, meeting, project, person, phone number, company, address, and correspondence related to a contact, just by typing in that contact's name. FIT Software's Full Contact (FC) is the closest approximation of this ideal currently available: it's an object-oriented database in which almost every piece of information occupies its own record, and related records are linked for easy access. The advantage of FC is a database that's fast, versatile, and powerful. The disadvantage is that to use this personal organizer, you must already be incredibly organized.

Records in FC are divided into six types: Activities, Contacts, Phones, Addresses, Companies, and Notes. Any record can link to any other record; a contact might be linked to several notes (conversations), three other contacts (coworkers), and two phones. Each of those records could then have other records linked to them—for example, one of the phone numbers could be linked to a company and other contacts. Linking records establishes software connections between bits of data that you have already related in your mind. You can create a new, linked record from within another record, or you can link existing records by dragging and dropping one onto another.

Having to manually link all your data gets cumbersome, so FIT thoughtfully provides Quick Phone Call Entry (QPCE) and Quick Contact Entry (QCE) screens. Filling in a QPCE is a snap; FC offers its best guess at the company or contact name while you type, complete with a pop-up menu of qualifying candidates. FC also has an extensive series of templates to ease importing data. I switched from Now Software's Now Contact and Now Up-to-Date with hardly a hitch—not a bad trick considering their semilinked nature.

Superlists—windows that display records as fields in columns—are the main

continues

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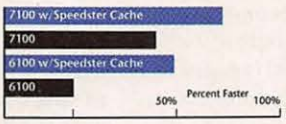
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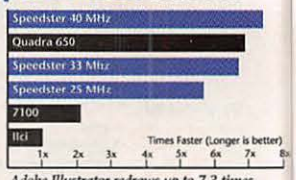


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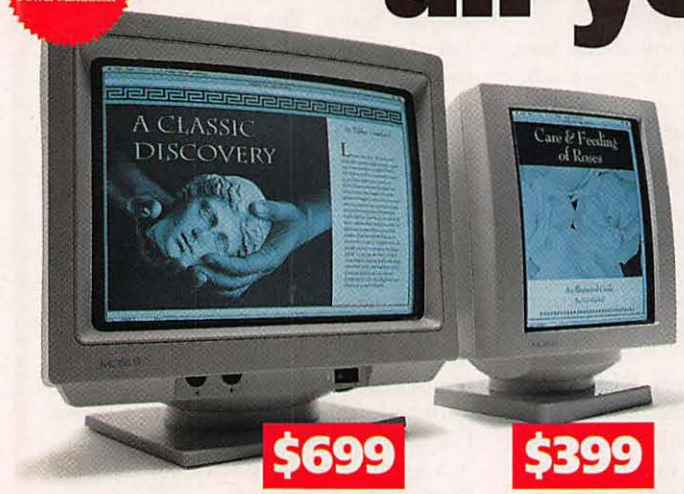
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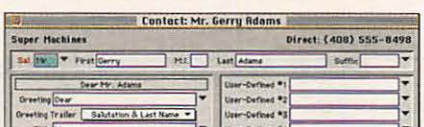
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way to view your data. Each record type has a separate Superlist, which is good and bad. You won't confuse a company with a contact, but you can work directly with only one type of data at a time. (You can't, for instance, bring up a list of all the Companies *and* Contacts in California.)

You select records to view by using filters, FC's version of a search—you define the criteria, such as a range of dates, and FC filters the records. Filters are fairly versatile, and you even get a dialog box loaded with pop-up menus to help you build the perfect filter. But FC depends on filters heavily, and using them is a chore. You can't edit a filter unless you've first used it, which means you select a filter, wait as the software sorts, edit the filter, then wait again. Of course, you can build a filter every time you want a new search, but it's not much quicker, and you end up with a bazillion filters.

There are pleasant amenities and cool features sprinkled throughout FC, but the program makes using them an effort. When linking to a contact record in a QPCE, FC forces you to enter the contact's last name and then first name, separated by a comma; elsewhere, the software concatenates a phone number with its descriptor (Main, Fax, and so on), so easy lookup is impossible. FC has a word processor with drag-and-drop mail merge, but it makes you juggle two pop-up menus nearly every time you write a letter. You can create repeating events, but only the first iteration appears in the Activities window. There are also a ton of tiny irritants: Notes windows can't be resized, new Activities always appear halfway off the screen, and Superlists don't automatically re-sort. Topping this catalog of unpleasant surprises is the lack of a database-wide search function.



Information Chain Each record in Full Contact can be linked to many others. Gerry Adams's record shows addresses, phone numbers, and related contacts, plus meetings and conversations.

Full Contact can handle with speed and style tasks that would choke other PIMs. But 90 percent of the time, using Full Contact feels like a full-time job.

—CAMERON CROTTY

Scenery Animator 1.0.4

Landscape Rendering and Animation Software

PROS: Renders high-quality pictures of real-world locations based on USGS map data; lighting and other features can be customized. **CONS:** Program's map coordinates don't correlate to paper maps. **COMPANY:** Natural Graphics (916/624-1436). **LIST PRICE:** $149; additional landscapes $10 each.

MW ★★★★

IT'S AMAZING. NATURAL GRAPHICS has squeezed a goodly portion of Yosemite Valley—from the massive face of El Capitán down to individual evergreen needles—into 170K of disk space. Yosemite is only one of the many three-dimensional landscapes that Scenery Animator lets you explore; also included are views of Oahu, the Grand Canyon, and Mount Saint Helens. Landscape files for additional locations—including Aspen, Seattle, San Francisco, Pikes Peak, Crater Lake, the Black Hills, and others—are available for $10 each.

Scenery Animator uses U.S. Geological Survey data (sampled every 30 meters) to create remarkably realistic 3-D representations of terrain. You can render an individual scene—complete with optional trees, water, snow, and clouds—or create an animation that flies the viewer through a landscape. You use real-world locales, or devise your own scenery with the program's fractal landscape generator. The program is smart (it won't let you place trees on a sheer cliff, for example), and it offers numerous customization options (you can specify that no trees grow above an elevation of 3000 meters, for instance, or redden a scene's colors to simulate evening light).

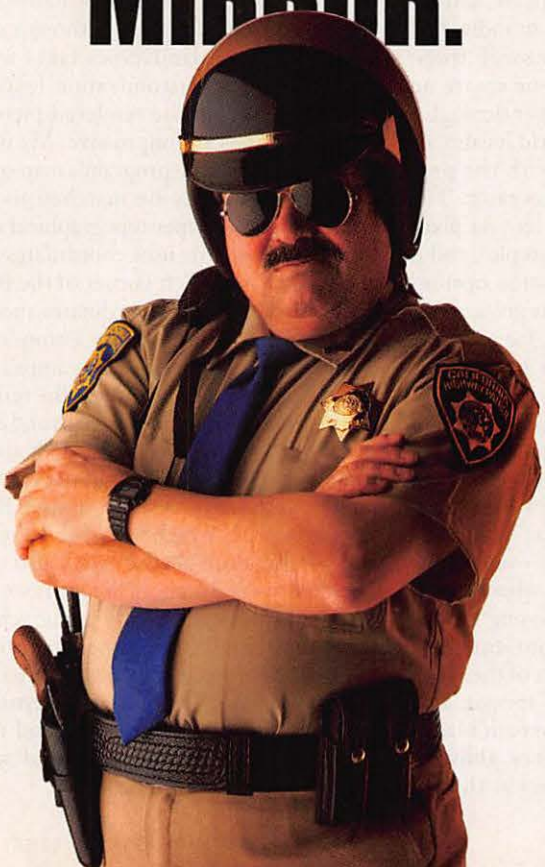
You navigate a landscape via several windows and control panels. The Map window shows an overhead view, with color-coded elevations. You view a scene through a simulated camera. The Camera View window shows a rough view through the camera's lens; when you've got the view you like—choosing a standard, wide-angle, or telephoto lens—you can render a detailed version of the scene and save it in PICT or TIFF format. The camera can be placed anywhere in a landscape: hovering 100 meters above a mountain peak, or gazing up at the sky through the leaves of a tree. You can also store a series of camera positions as key frames and create an animation, which can be saved as a QuickTime movie, a PICS file, or a series of PICT images. As with any program that renders complex pictures, I'd recommend a fast processor or a lot of patience (or both). Rendering time depends on the complexity of the scene, the rendering method used (faceted produces a rough landscape of large triangles, while smooth or textured produce more detailed—and slower—renderings), and whether optional elements such as trees or clouds are added. I chugged along OK on my Mac IIcx, using in other programs while scenes rendered in the background, but was much happier when I borrowed a Quadra 800.



From Dawn to Dusk Scenery Animator lets you position a simulated sun to create shadows. You can alter the colors of land, water, and sky—say, to darken a cloudy landscape or add a rosy tint to a sunset scene. Here, the same image was rendered with different light and color settings to show dawn and dusk.

Scenery Animator is a pleasure to use. The manual is clear and informative, the program is well designed (although navigating through landscapes takes some practice), many customization features are provided, and the rendered pictures and animations are impressive. My main complaint is that the program's map coordinates can't easily be matched to the coordinates on a paper topographical map (Scenery Animator uses coordinates relative to the lower left corner of the map, rather than absolute coordinates such as longitude and latitude). For example, to create a digital picture of my campsite in Yosemite, I'd have to compare the terrain on the paper and computer maps and estimate where the site was. A Natural Graphics representative said the company is considering adding digital line-graph overlays, which would show roads and other man-made features. I also wish I could display distances in feet as well as meters (I can't help it—my public school failed to drum the metric system into my head), and for some graphics tools to add objects to scenes. But Scenery Animator's flaws are few, and I'd recommend it to artists, animators, educators, and armchair travelers.—ERFERT FENTON

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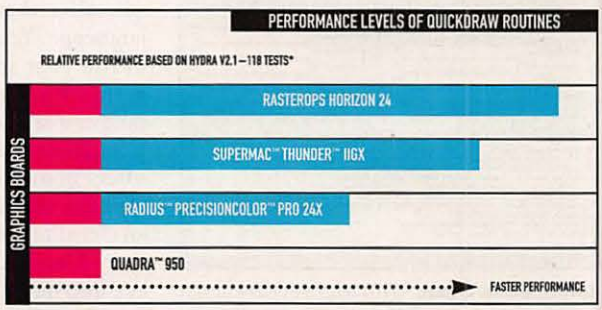
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*Results based on tests run on a Quadra 950 with available products as of 2/1/94.

Circle 90 on reader service card

Koyn Fractal Studio 2.02

Educational Software

PROS: Creates colorful fractals at up to 2450 dpi; draw-program–like fractal design; fast rendering. **CONS:** Cannot create many classic fractals; poor program design; saves images only as PICT. **COMPANY:** Koyn Software (314/878-9125). **LIST PRICE:** $149.95.

MW ★★★

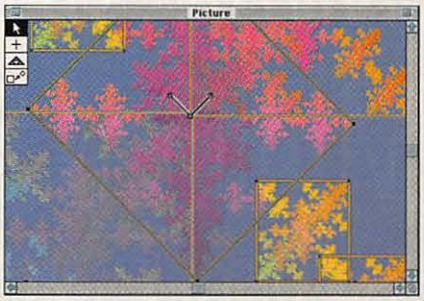
FRACTALS—SHAPES CONTAINING infinite detail and that often exhibit self-similarity (portions of the shape resemble the whole shape)—are one of the most spectacular intersections of science and the visual arts. Koyn Fractal Studio enables you to generate beautiful fractals of your own design by means of Iterated Function Systems (IFS). To do so, you first draw the basic outline with a simple polygon tool, either freehand or by using an imported image as a template. You then clone the outline one or more times, alter each clone, and hide all the outlines (see "Handmade Fractals"). You can color the background, assign a color to each part of a fractal, and specify a number of attributes that blend colors and create textures.

At 72 dpi, Fractal Studio renders 8-bit fractals relatively quickly (in a few minutes), especially if your Mac has an FPU. You can specify renderings at up to 24-bit color and 2450 dpi, but these require major investments in RAM and time. Once your fractal has been rendered—and Fractal Studio is capable of beautiful renderings—you can zoom in (up to 1 million times, according to Koyn Software) on any area. Rendered fractals can be saved only as PICT files.

Although Koyn Software says the program is for fractal innocents and experts alike, prior experience certainly helps. The manual's tutorial section and the collection of sample fractal files assist novices to get going; but frankly, few people can make fractal geometry seem easy, and the manual's author is not one of them. Sadly, the design of the program doesn't help either. Among other things, there are tools that should more logically be commands, and commands that are tools in many graphics programs. There is no easy way to make regular polygons or create a clone that is a specific fraction of the basic outline's size. And defining a color scheme requires visits to a variety of dialog boxes.

Iterated Function Systems–generated fractals range from abstract shapes to mimics of natural forms such as leaves, trees, clouds, and snowflakes, but IFS is not the only fractal-generation method. There are many classic types of fractals—including the Mandelbrot and Julia sets and realistic fractal landscapes—that Koyn Fractal Studio cannot generate; for these types of fractals, you will have to turn to a program like Springer-Verlag's more versatile but more challenging Beauty of Fractals Lab. Koyn Fractal Studio is a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it is not an all-fractals-for-all-people program. That program has yet to be written.

—ROBERT C. ECKHARDT



Handmade Fractals In Koyn Fractal Studio you scale, rotate, skew, and move a part of a fractal by dragging on the handles attached to its outline. The mathematically inclined can specify transformations numerically.

The Cruncher

Educational Spreadsheet

PROS: Creative; easy to use; educational. **CONS:** Slow; lacks necessary spreadsheet functions. **COMPANY:** Davidson & Associates (310/793-0600). **LIST PRICE:** $59.95.

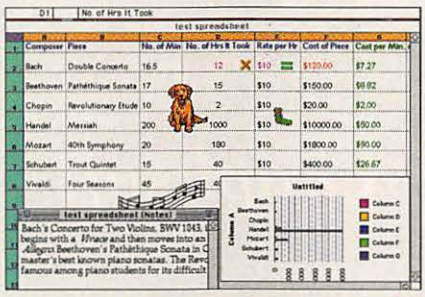
MW ★★★

KIDS AND ADULTS SHOULD LIKE THE Cruncher, a combination educational spreadsheet and business application. As a teaching tool, it shows kids spreadsheet basics; as a spreadsheet, The Cruncher can calculate and graph.

The Cruncher's clever, creative animated tutorials demonstrate how spreadsheets calculate. A selection of projects shipped with The Cruncher can help kids figure out if their families can afford a dog or a new stereo. You can even customize recipes: using the Recipe Converter template, you type in a recipe and the number of people the original recipe serves, then indicate how many people you want to serve, and the template converts it for you. (This is a use I'd never thought of for spreadsheets—I'm sure my future dinner guests will be grateful.)

The animations are cute, but they make The Cruncher sluggish; on my Mac IIci, I often waited a few seconds before actions occurred. The Cruncher is aimed at families, teachers, and students, many of whom have lower-end machines and may find the application quite slow.

You can decorate spreadsheets with color text and pictures provided in the program's Sticker Picker. You select an item in the Sticker Picker, assign a sound to it, and place it anywhere in the spreadsheet. The Cruncher also speaks: select a cell and hit a button, and a computerized voice reads to you. It even knows to read *TN* as *Tennessee* and *lb.* as *pound.* Why this is useful I'm not really sure, but kids will probably enjoy it.



The Price of Art The fictional data in this spreadsheet shows how much great works of music cost to write. The graphics are from The Cruncher's Sticker Picker.

The Cruncher performs basic spreadsheet functions like graphing, number formatting, and calculations. But users accustomed to more-sophisticated spreadsheets like Microsoft Excel will miss such functions as the ability to wrap text in a cell and to sort data. Also, calculation formulas can be hard to understand. For some functions, you can use basic spreadsheet functions like **=D3/F3.** But if you want to multiply that number by five, you have to write **=SUM(D3/F3*5).** It's hard to know when you need to insert the function type (**SUM**, in this case) in the formula.

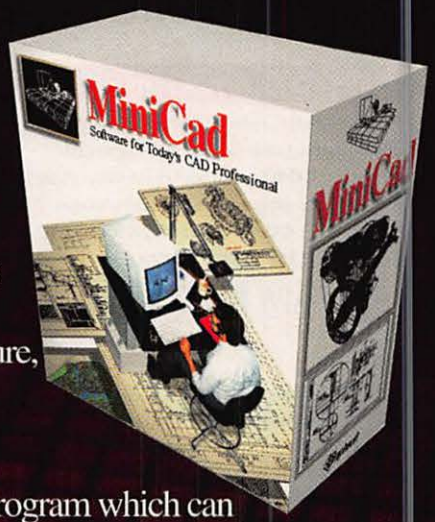
Aside from the calculation confusion, the only technical problem I had with the product was its sound. Even though my Sound control panel was set to zero, The Cruncher played music at a normal level—to the dismay of my coworkers—and I couldn't figure out how to turn off the start-up sound. Other than that, the Cruncher is uncomplicated. Information is easy to find in the manual and online, and when I called, Davidson's technical support was helpful.

The Cruncher is more effective as an educational tool: its spreadsheet capabilities are limited. If you can live without the advanced functions and can tolerate the slow speed, The Cruncher is a good spreadsheet choice. If you want to teach a child spreadsheet basics, The Cruncher will do the job.—JOANNA PEARLSTEIN

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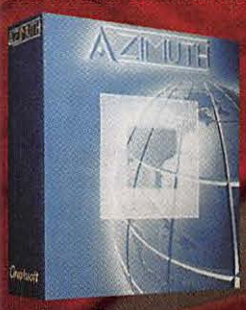
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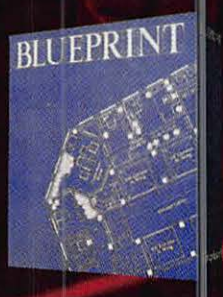
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PopupFolder

Finder Utility

PROS: Simple and intuitive; provides easy access to files and data. **CONS:** Can be sluggish on full drives. **COMPANY:** Inline Software (203/435-4995). **LIST PRICE:** $59.95.

MW ★★★

REMEMBER WHEN YOU FIRST GOT your Mac? The hard drive seemed a vast, open expanse you couldn't wait to fill with the latest software and your great American novel. By now, though, you've probably spent far too much time managing that territory—moving files around and rummaging through folders in search of documents.

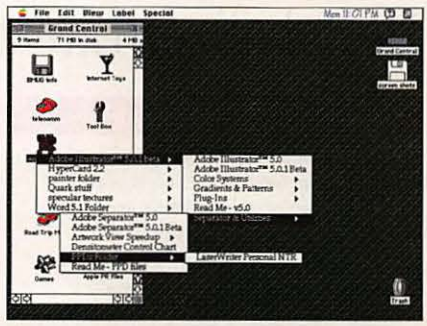
Hierarchical menu utilities, such as Now Software's WYSIWYG Menus, Inline Software's HAM, and Kiwi Software's Kiwi Power Menus, all take a similar approach to the file-management challenge. Rather than make you open a dozen windows to find that control panel or document buried deep in your drive, hierarchical menus enable you to put frequently used folders, subfolders, and aliases in the Apple menu and then open them using simple pop-up menus. But these utilities limit you to the folders and applications you've had the foresight to put into the Apple Menu Items folder. If you're already that organized, maybe you don't need hierarchical menus to begin with.

Inline Software's PopupFolder goes a step further by giving you hierarchical access to all the folders on your Mac. By clicking and holding on the icon of any folder, mounted volume, or floppy disk you instruct PopupFolder to search that item (up to five folders deep), giving you easy access to documents and applications all over your drive.

PopupFolder is primarily a Finder enhancement, but it also operates within applications, so you can use hierarchical pop-up menus to save and open files. Best of all, filing existing documents in folders becomes a simple matter of grabbing the files you want to put away and then dragging them onto the appropriate icon. When the menus pop up, you just drag the files and drop them into any folder.

When it is readying pop-up menus for every folder, PopupFolder seems sluggish; the program hesitates slightly over each icon while it scans your Mac's contents. Changing the mouse's double-click speed can help, but if many subfolders are nested on your drive, the slowdown can be a trifle annoying.

PopupFolder is easy to install—just drop the control panel into the System Folder and restart your Mac. But be aware that you may need to disable certain extensions when you restart the first time after installation. PopupFolder's registration dialog box wants to be the first item that launches, and if you are running start-up extensions such as E-mail or virus-protection software, PopupFolder can cause a crash when you restart.



Changing the Way You Use Your Mac Use PopupFolder to get to those deep, dark, hard-to-reach corners of your hard drive.

For the most part, PopupFolder is so handy and intuitive to use, you wonder why it isn't built into the Mac's system software. For those of us with hard drives full of folders packed within folders, it's a welcome improvement to Finder navigation.
—MATTHEW HAWN

DateView 1.0.1

Calendar/To-Do Manager

PROS: Easy to learn; integrates with InTouch contact manager. **CONS:** Can't see to-do's in grid view. **COMPANY:** Advanced Software (408/733-0745). **LIST PRICE:** $99.95.

MW ★★★

WITH DATEVIEW, ADVANCED SOFTware is aiming at personal-calendar users who are willing to sacrifice some features to get simplicity and speed. DateView loads its files completely into RAM, so it's a good choice for PowerBook users—since it won't spin up the hard disk, it saves battery power. DateView is a single-user product; if you need to share your calendars with other users, then Now Software's Now Up-to-Date or Aldus's DateBook Pro are better choices, as both are networkable and multiuser programs.

DateView has two types of multiday display modes. The list display shows events and to-do's sequentially (see "Schedule View"); the grid display shows days with lines marking times. Double-clicking on the header of any day zooms in, filling the screen with the day's agenda. You can customize the list or grid displays to view one or more weeks at a time.

The program allows four types of events: Block of Time, Point in Time, Date, and To-do. You can set to-do's to carry forward if not marked as completed. You can enter a series of recurring events in a single step and later reschedule one event in the sequence without affecting the others. DateView shows overlapping events side by side in the grid display.

It's easy to enter new events. If you're in the grid view, you just click and drag across the time the event will occupy; the Edit Event dialog box appears, and you set the type of event and fill in the event's description. You enter new events in list views by double-clicking on the day, which brings up the Edit Event dialog box.

One drawback is that to-do's appear only in list views; if you're in a grid view, you can't see to-do's at all. I found this so annoying that I invariably used only list views. I'd also like to see ⌘-*key* equivalents for the pop-up menu choices in the Edit Event dialog box; as it stands now, you must leave the keyboard and use the mouse to set the category, type, and priority of an event.

DateView can link events to Advanced Software's InTouch contact manager, even under System 6.0.X. Linking a DateView event to InTouch is very easy and takes only a few seconds. However, linking in the other direction, to a date from within InTouch, is considerably slower.



Schedule View This two-week DateView list view shows icons that denote events' priorities. Events with the head icon are linked to an InTouch contact record. Note that past days are grayed out.

If you have complex scheduling needs, then you'd be better served by a program with more features than DateView offers. But if you want a calendar program that takes only a few minutes to learn and can handle basic scheduling, DateView makes sense.—TOM NEGRINO

DeBabelizer Lite 1.0

Graphics-Conversion Software

PROS: Supports a huge variety of file formats; simple interface; batch processing; supports many Photoshop plug-ins. **CONS:** Bitmapped formats only; some plug-ins don't work with it; images must fit in RAM. **COMPANY:** Equilibrium Technologies (415/332-4343). **LIST PRICE:** $129.

MW ★★★★

WHEN I FIRST STARTED USING DeBabelizer, I was astounded at its prowess in opening, converting, manipulating, and processing graphics files of almost any format—quickly and automatically (see *Reviews*, November 1993). Its $299 price tag placed it out of the reach of people who only occasionally need graphics conversion, however, and its complex interface was daunting for casual users.

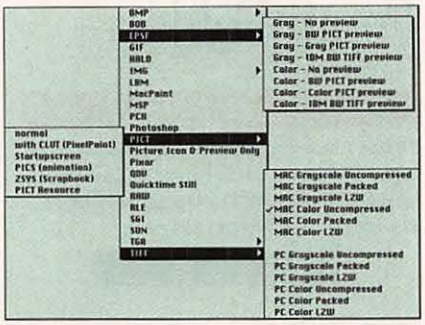
Equilibrium Technologies addresses both of these issues with DeBabelizer Lite—a version of the original program with a much narrower range of capabilities, a $129 price tag, and an interface that any Macintosh user can navigate easily.

At its most basic, DeBabelizer Lite is simply a program for converting graphics files from one format to another. Gone are all the esoteric options for dithering, resizing and resampling, scripting multiple operations, remapping color palettes, and the like. DeBabelizer Lite opens graphics files in one format and saves them in another.

You can convert individual files, or instruct the program to go through a whole folder and convert every image in the folder. An ingenious set of options lets you rename the resulting files sensibly.

Although there's a lot less to DeBabelizer Lite than its older sibling, not all of the controls are gone. There are options for saving in various flavors of key formats (color/gray scale, and compressed/uncompressed TIFF, for instance) and for changing the number of colors in an image. And you can choose from a few common Mac and Windows color palettes. You can also change the image's aspect ratio from DOS PC to Mac or vice versa—avoiding the squashed or stretched look that commonly results from moving screen shots between platforms.

Many Photoshop-compatible plug-ins work within DeBabelizer Lite, including filters and acquire and export modules. The program can even run a filter on a batch of images in a folder as each image is being translated. Unfortunately, many plug-ins that come with Photoshop only work with Photoshop (for example, the sharpening filters and the JPEG Export module).



On the Menu Many graphics professionals will find that DeBabelizer Lite's selection of graphics file formats offers all that their images require and more.

DeBabelizer Lite's only other major failing is its use of RAM for image processing. If an image doesn't fit in the program's allocated memory partition, you can't use DeBabelizer Lite to convert it. This is far from fatal, but it's worth considering if you're short on RAM and don't want to resort to the sluggishness of virtual memory.

DeBabelizer Lite is a terrific graphics utility, offering a choice selection of its forebear's capabilities at a nice, slim price.

—STEVE ROTH

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TimeSquare 1.0

Scheduling Program

PROS: Fast; flexible viewing options. **CONS:** Labels cannot be grouped; no multiday events; limited error notification when importing data. **COMPANY:** Team Building Technologies (514/278-3010). **LIST PRICE:** $149 for two users.

MW ★★★

IF YOUR PAPER ORGANIZER IS JAM-packed, then it's time to consider a computer-based scheduler like TimeSquare. Unlike programs that restrict you to viewing single days, weeks, or months, TimeSquare lets you decide exactly how many days to display. You can also specify whether the calendar scrolls forward or backward in weekly or daily increments. (TimeSquare's use of both the horizontal and vertical scrolls bars can be confusing at first, but it soon becomes second nature.) A handy feature lets you jump directly to the current day with a single click.

TimeSquare supports two types of events: to-do's, which aren't associated with any date or time, and timed activities, which are. You can set timed activities to carry forward on a daily basis until they're marked as completed. Unfortunately, you can't schedule activities that span several days. TimeSquare does support recurring events, but not as flexibly as other programs.

TimeSquare's alarm extension can remind you about timed events up to 999 days in advance, even if the application isn't running. When a pop-up alarm appears, you can clear it permanently or indicate that you want to be notified again up to 60 days later. If you don't respond in 1 minute, the alarm disappears, only to reappear in 5 minutes. You can't snooze an alarm without using the mouse, however.

TimeSquare lets you categorize activities by assigning labels to them. You can define up to 30 different labels, each with its own color. Since events appear in the color of their label, it's an easy way to pick out related events in a busy schedule. The only missing feature is the ability to group labels into sets as you can with Now Up-to-Date. (Now Up-to-Date's sets make it easy to view all related categories or labels, such as all personal activities.)



Day by Day TimeSquare sports a flexible calendar that lets you display up to 35 consecutive days. Undated to-do's appear in the list on the left.

TimeSquare supports multiple users by making extensive use of System 7's publish and subscribe. People on a network can view—but not alter—activities from another calendar by subscribing to a published edition that includes all of the events assigned to any label in the original file. If two people need to modify events in a calendar, however, they must have read-write access to a common calendar file.

For those rare times when you're away from your Mac, TimeSquare lets you print your schedule in a variety of formats. TimeSquare also lets you import and export calendars as either tab- or comma-delimited files. (If you try to import an event with a description field longer than 255 characters, the import process terminates without telling you why.) TimeSquare's manual is clearly written. Finally, technical support is friendly, if not toll-free.

All in all, I was quite impressed with the first release of TimeSquare: it's fast and builds on the strong points of its predecessor, AgentDA. With a few changes, Team Building Technologies could have a winner.—FRANKLIN N. TESSLER

page without scrolling, shrinking, or the Portrait/15 Pivot makes sense.

Let's face it. A monitor is only as good as its ability to show you a readable page of text.

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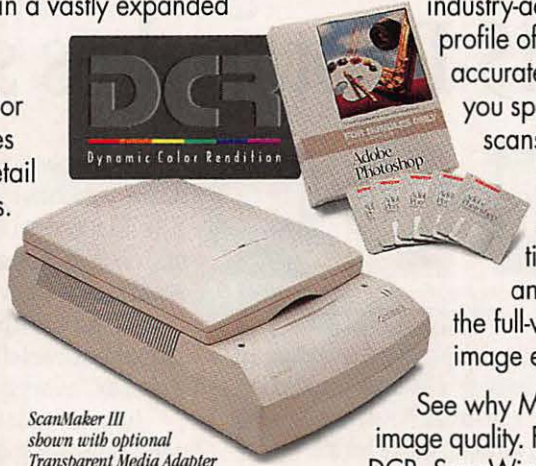
Circle 89 on reader service card

Billions And Billions And Billions And Billions...of Colors.

Introducing the ScanMaker® III, the first 36-bit, single-pass, color flatbed scanner that's also the best value in the cosmos.

The ScanMaker III's 36-bit color scanning capability allows it to capture an astronomical 68 billion colors. It has an optical density that reaches 3.4, unprecedented for a flatbed scanner, which results in a vastly expanded dynamic range. What all this means is, that your scanned images will have smoother color gradations, denser color values and substantially increased detail in shadow and highlight areas.

Performing like scanners priced somewhere in the stratosphere, the ScanMaker III's scans are so sharp, you will actually reduce the amount of time spent in post-scanning software to sharpen images. And its optical resolution of 600 x 1200 dpi (enhanced through software to 2400 x 2400 dpi) is great for enlarging small originals.



ScanMaker III shown with optional Transparent Media Adapter for scanning transparencies up to 8" x 10".

For accurate scanned color, DCR™ (Dynamic Color Rendition), Microtek's award-winning color calibration/correction system calibrates the ScanMaker III to a photographic industry-accepted calibration target creating a custom profile of your specific scanner. This ensures the most accurate color possible as you scan an image, so you spend a lot less time adjusting the color of your scans to match your originals.

Windows users also get Microtek's ScanWizard™, a drag and drop application for instant image management, faxing and printing. The ScanMaker III also includes the full-version of Adobe Photoshop for complete image editing and color separations.

See why Microtek is the universally accepted leader in image quality. For more information about the ScanMaker III, DCR, ScanWizard, or for the name of your nearest authorized Microtek reseller, call **1-800-654-4160**.

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Better Images Through Innovation.

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Icon Mania 1.0

Icon-Editing Utility

PROS: Simple interface; creates thumbnails from graphics files; good icon-editing tools. **CONS:** No text tool. **COMPANY:** Dubl-Click Software (818/888-2068). **LIST PRICE:** $69.95.

MW ★★★★

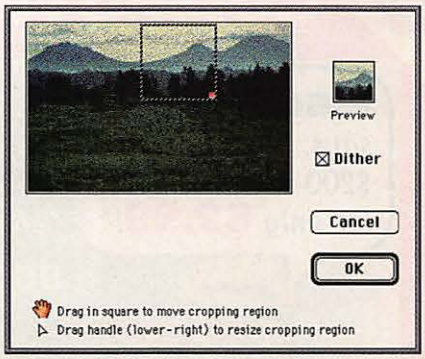
ICON MANIA IS A DELIGHTFUL ICON-editing utility that comes with terrific tools for building new icons, even if you have no artistic talent all all. Unlike some icon-editing programs, Icon Mania isn't a system extension or control panel; it's a small stand-alone application that makes editing batches of icons easy—and entertaining.

The program's main interface, consisting of three windows, is a model of clarity. The left window displays a library of custom icons; you can create your own libraries or dip into the 730 icons included with the program. The middle window shows the icons on any volumes currently mounted on your Mac. The window on the right is the pasteboard, a storage area where you can paste icons-in-progress or library items you access frequently. To apply an icon to a file, folder, or disk, you simply drag a custom icon—from either the library or pasteboard—onto the icon you want replaced.

The icons that come with the program are outstanding; the majority are colorful, sophisticated, and well designed. (The icons look fine in black and white but are spectacular in color.) You can go wild with icons of space creatures, animals, bugs, Elvis, Ronald Reagan, and the Marx brothers. On a more practical note, there are colorful 3-D versions of popular application icons and folders as well as a set of sharp-looking icons representing floppy disks, hard drives, and removables. Icon Mania also allows you to replace your default system icons with full-color, jazzed-up versions of folder, control panel, Trash Can, and alert icons.

But this isn't just an icon collection; it's an icon editor. Choosing the Edit command—or just double-clicking on an icon in the library or on the pasteboard—opens a window for modifying icons on a pixel-by-pixel basis. You can also create new icons from scratch. A row of Instant Tool buttons allows you to rotate, invert, and flip pieces of your icon designs with a single click. Still, a text tool would make it easier to add letters and numbers to icon designs.

Some of the program's icon-making commands are particularly noteworthy. First, the program lets you merge two different icons into a single new design using Paste Into Icon, a powerful command that



Instant Thumbnails Icon Mania can create thumbnails—this dialog box lets you choose the portion of the image you want in the custom icon.

enables you to take one icon and superimpose it within the boundaries of a second. Another outstanding feature is the Thumbnail command. Select a graphics file, choose Thumbnail, and Icon Mania builds a custom icon containing a thumbnail of the actual image contained in the file. The command produces great results and works with files in PICT, MacPaint, TIFF, GIF, PICS, EPS, and StartupScreen formats.

Icon Mania won't make you more productive, and it won't make your Mac more powerful. But after seeing how vibrantly Icon Mania can transform a window full of boring, generic folders, you may just decide you can't live without it.—JOSEPH SCHORR

PowerMerge 2.0

File-Synchronization Software

PROS: Better file- and conflict-handling; can compare and launch documents within PowerMerge; locates duplicate files; improved status information. **CONS:** Can't schedule synchronizations. **COMPANY:** Leader Technologies (714/757-1787). **LIST PRICE:** $129.

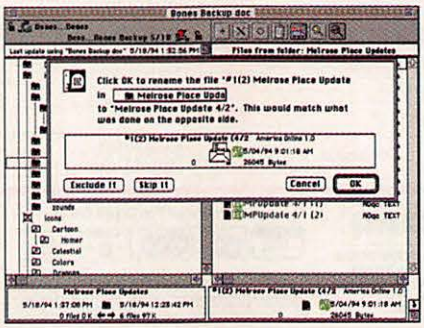
MW ★★★★

POWERMERGE IS ONE OF SEVERAL synchronization programs that help you keep individual files, folders, or entire volumes organized and up-to-date. PowerMerge 1.0.2 was a useful program (see *Reviews*, *Macworld*, April 1993). Version 2.0 adds important new features.

Here's a typical scenario. Suppose I decide to work at home. I open PowerMerge on my Mac at work, locate the files I want to work on, and have PowerMerge copy them to a floppy. At home, I copy the files onto my Mac. I finish my work and return to the office Monday morning, deadline met. Now I want to replace the files on my workplace Mac with the new files. PowerMerge can look at both the floppy disk and the hard drive on my workplace Mac and can replace the old versions of files with the new versions.

That's synchronization at its simplest. But sometimes I just can't remember which file is my working copy and which file is a different version, an archival copy, or ready for the Trash Can. What's a gal to do?

Each time you open PowerMerge, it presents the preview screen. From this screen you can open files you're not sure about (without leaving PowerMerge) and take a look. If you've modified both desktop and floppy versions of a file, PowerMerge can do a text comparison—either automatically or by using a third-party product like DocuComp—or PowerMerge can open both copies and let you eyeball them, line by line. You can also rename



Conflict Resolution During synchronization, PowerMerge notifies you if a file name has changed.

files, trash superfluous copies, as well as set PowerMerge to copy new files (or tell it not to copy a particular file anymore). To help identify files, a status box at the bottom of the preview screen lists file types and creation/modification dates, and also shows how you've set up PowerMerge to deal with each file. You can choose to have PowerMerge display apparent duplicates at the top of the preview screen.

PowerMerge can also be used as a backup program. You can lock the working volume, making it a one-way synchronization. You can designate—in the preview screen—the working volume as a master volume; again, the synchronization is one-way, but PowerMerge makes the contents of the backup, or slave, volume mirror the master volume, so you end up with an exact duplicate of the working volume. Lastly, for maximum flexibility you can select the two volumes and tinker with the settings each time you want to back up, especially if you want to keep several versions of a backup file or retrieve files from the backup volume without a full restore.

PowerMerge is a powerful file-management tool. If you're using 1.0, or have never tried synchronization software, check out PowerMerge 2.0. I see a lot of software, so when I not only install but also continue to use a program over a year later, I know it's a hit.—SUZANNE COURTEAU

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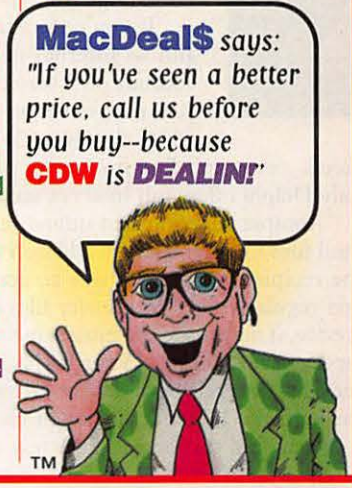
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ONLINE SERVICES PUT OTHERWISE SCATTERED CONVERSATIONS and resources all in one place that's accessible from your desk. On a variety of nationally available commercial online services—such as America Online, CompuServe, Delphi, eWorld, GEnie, and Prodigy—you can get stock quotes, technical support, or a dinner date; download software; use an encyclopedia; send mail and faxes; browse magazines; make airline reservations; and participate in written discussions on topics ranging from computers to politics to "Beverly Hills, 90210."

Macworld's Guide to Online Services

Which of these five services is right for you?

The convenience and dynamism is difficult to overstate.

Of course, many of the features offered by online services are available elsewhere, and the convenient access to them may be not be worth the price. Sure, it's neat to access the *Official Airline Guide* online, but why rack up charges to figure out the best pricing or to check seating availability when you can call a travel agent to do the same for free? You can send a letter to President Clinton by E-mail or the Postal Service, but either way it'll probably get minimal attention. And while you can read news and financial information online, doing so in large quantities gets expensive. If you really need that information for business purposes, your company should investigate more-direct methods of providing it, such as Dow Jones's DowVision (609/520-4677) or Desktop Data's NewsEdge (617/890-0042, 800/255-3343).

ONLINE SPECIAL REPORT

If you're looking only for electronic mail and an Internet mail gateway, you can get an account on a service such as MCI Mail ($35 a year plus some per-message charges; 202/833-8474, 800/444-6245). If you want full Internet access, you won't find it on most of the services covered here; only Delphi offers full Internet access to its members.

Another function that online services offer is the ability to send files to other users in addition to E-mail. The catch is that the recipient must also have an account on the service—so if you regularly need to transfer files to someone on a particular service, it may make the most sense to obtain an account on that service (see "Connect Your LANs," in this issue). Most of the services covered here do not allow users to attach files sent through the Internet, although users wishing to send simple text may find that copying the text into a mail document is the easiest way to send it.

When choosing a service, you should consider its general feel, its offerings, interface, support for Macintosh users, Internet access, and costs.

by Joanna Pearlstein

Illustration by Mick Wiggins

The appeal of the large online services is that they offer a wide variety of databases, topical discussion groups, and resources—in other words, the electronic version of a shopping mall.

Core services include general, business, and sports news; computer forums and news; reference materials; electronic mail and bulletin boards; business statistics and data; games; shopping services; travel services; and educational reference material.

Still, the different online services do have different emphases, so even though they all offer a range of basic services, they are not interchangeable.

• *America Online (AOL)* Within the core feature set on AOL (703/448-8700, 800/827-6364) you can find the Library of Congress, Compton's Encyclopedia, news organizations like Cable News Network and *Time*, an extensive software library, stock quotes, sports news, a career center, a Macworld forum, American Airlines reservations, chat rooms, and special-interest areas including everything from a ham-radio club to an active gay and lesbian forum. AOL's emphasis is on information for home, recreational, and business users.

• *CompuServe (CIS)* Known for its vast wealth of databases and research-oriented services for financial, legal, and medical interests, CompuServe (614/457-0802, 800/848-8199) offers the core set of services, as well as Books in Print, computer vendor forums, brokerage services, Consumer Reports, Associated Press news, and the electronic edition of the *Official Airline Guide*.

• *Delphi* An Internet-oriented service, Delphi (617/491-3342, 800/695-4005) offers most core services, with its main omissions being vendor forums and graphical software. Delphi offers news from Reuters and United Press International; stock quotes; airline and car-rental reservations; the Computerized AIDS Information Network (CAIN); the Nynex Electronic Yellow Pages (covering businesses in the Northeast); Grolier's Encyclopedia; movie reviews; and computer vendor forums for a variety of platforms, including Macintosh.


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AOL and CompuServe have the most Macintosh resources



• *eWorld* By the time this article appears, Apple will have replaced its AppleLink service with its new online service, eWorld (408/996-1010, 800/775-4556) (see "Apple's Online Mall," *News, Macworld*, March 1994). At press time, eWorld was expected to launch in mid-June. A look at a prototype of the service revealed that its contents will be similar to those of other online services.

The core services that eWorld will provide include news from Reuters and *USA Today*, stock quotes, movie reviews, Grolier's Encyclopedia, a Living Well section, and a computer center. But with the service's software still in flux, it's too early to assess its potential success.

• *GEnie* Within GEnie's (301/340-4494, 800/638-9636) core areas, you can access stock quotes; Dow Jones News Retrieval; the Eaasy Sabre airline-reservation system; a GEnie mall; TRW business credit profiles; Grolier's Encyclopedia; forums for Macintosh developers and users; discussion areas; and a searchable database of articles from newspapers published in the United States, including the *Los Angeles Times*, *Washington Post*, and *Chicago Tribune*.

• *Prodigy* The core areas of the Prodigy Service (914/962-0310, 800/776-3449) let you use an encyclopedia, read news, go shopping, discuss computer problems, and get stock quotes. There are more kids on Prodigy than any other online service, and Prodigy's plentiful educational offerings include games, National Geographic adventures, and a Sesame Street area.

In recent years, Prodigy has come under fire for its policy of screening messages sent to message boards before posting them. Prodigy communications manager Deborah Borchert said if a message contains an obscenity or blatant bigotry or hate, the message will be returned to the sender. Borchert stressed that the screening is done only for message boards, not private E-mail.

Mac Resources Compared

America Online and CompuServe have by far the most Macintosh resources.

Vendor forums Both AOL and CompuServe have lots of Mac vendors online, and those vendor forums are often good places to get technical support, exchange tips with other users, and download bug-fixes and new drivers. GEnie and Prodigy both have few Mac vendors online.

At press time, eWorld had 25 vendors online, including Aladdin Systems, Deneba Software, Farallon Computing, Global Village Communication, and SuperMac Technology. Apple said eWorld will have 50 Macintosh vendors online at launch, and the company will provide tech support for its own products through eWorld.

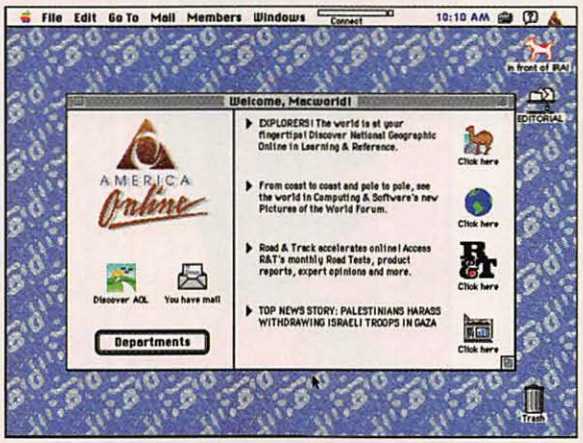
AOL and eWorld have a Mac-world forum, while the ZiffNet/Mac service (which includes MacUser and MacWeek forums) is available on CompuServe, Prodigy, and eWorld (extra fees apply on CompuServe and Prodigy). ZiffNet/Mac is also available as a separate service ($2.95 per month plus some connect fees; 617/252-5000, 800/666-0330). In all three publications' areas, readers get a chance to chat with editors, ask questions, exchange tips, and read selections from the magazines.

Software libraries Offering more than 50,000 Macintosh files, America Online has the best software library; CompuServe follows with over 20,000 files. Shareware fans may want an AOL membership just for its extensive shareware collection. It's easy to get technical support or software files on AOL, but CompuServe's sophisticated text-searching abilities give CompuServe the edge over America Online in finding specific information. CompuServe charges users the hourly rate for accessing its excellent Mac resources. (Although CompuServe's 9600-bps access costs twice as much per hour as 2400-bps, you should download at 9600 bps because it usually takes about one-fourth the time. But it's cheaper to browse, send mail, and post notes at 2400 bps.)

Prodigy is the only national online service that doesn't provide software-downloading capabilities. Instead, the service sells shareware kits, which cost around $40 and are mailed to customers. Prodigy says that users aren't paying for the software, but rather for the "duplicating and cataloguing service." But it's hard to determine what exactly is included in the shareware kits, since there's no index, and paying for them pretty much takes the fun out of try-before-you-buy shareware.

A View of Two Services For getting around CompuServe (top), its Information Manager has icons, a tool bar, and a customizable list of favorite places. America Online's start-up screen (bottom) features colorful icons for navigation.





Internet Access Still Limited

The only national service that offers full Internet access is Delphi. At press time, America Online users could access Usenet newsgroups. Access to Gopher and WAIS (Wide Area Information Server) databases is expected in the future. GEnie users can access an Archie server, browse an Internet software library, read newsgroup files, and ask GEnie staff members to retrieve files from the Internet. Apple has promised eWorld Internet functionality in the future. (See the sidebar "How to Ride the Internet" for information about Internet terms and service providers.)

CompuServe offers no Internet functionality beyond simple mail, and the service charges 15 cents for each Internet message sent and received. While the service lets you decide whether to read (and therefore be charged for) a message, users with heavy Internet needs may find CompuServe too expensive.

But Prodigy users fare even worse: to send Internet mail on Prodigy, members must use a mail-manager program—which, at press time, was expected to be available for the Mac by the end

How Much Do Online Services Really Cost?

Because individuals' online usage varies widely, it's hard to characterize a service's costs in a single example. So, we chose three different scenarios (light, medium, and heavy use) to illustrate the wide range of fees an online user can incur. If you know how you would use an online service, the figures on the right will help you estimate your own costs.

Light use is a conservative estimate of online usage: 8 hours a month, 6 off-peak and 2 on-peak, all at 9600-bps. That includes no extended services and no Internet mail fees. (For Delphi we assumed the 10/4 plan.)

Medium use is a more generous estimate: 15 hours a month, 6 on-peak and 9 off-peak, with 3 hours of off-peak extended services and 10 Internet messages, all at 9600-bps. (For Delphi, we assumed the 20/20 plan and the $3 Internet fee.)

Heavy use is a very generous estimate: 15 hours a month of on-peak usage at 9600-bps (7 hours of extended services), 5 hours of off-peak usage at 9600-bps, and 30 Internet messages. (For Delphi we assumed the 20/20 plan and added the $9 hourly SprintNet charges that most people in the United States will incur during business hours.)

SERVICE	MONTHLY FEE		HOURLY RATES				LIGHT USE	MEDIUM USE	HEAVY USE
	Price	Number of Off-Peak Hours Included	OFF-PEAK 2400	OFF-PEAK 9600	ON-PEAK[A] 2400	ON-PEAK[A] 9600			
America Online	$9.95	5	$3.50	$3.50	$3.50	$3.50	$20.45	$44.95	$62.45
CompuServe[B]	$8.95	0	$4.80	$9.60	$4.80	$9.60	$8.95	$39.25	$80.65
Delphi	$20.00[C]	20					$44.00	$77.00	$158.00
eWorld	$8.95	2	$4.95	$4.95	$7.90	$7.90	$44.55	$91.00	$142.30
GEnie	$8.95	0	$3.00	$9.00	$12.50	$18.50	$99.95	$200.95	$331.45
Prodigy	$14.95	2[D]	$3.60	$3.60	$3.60	$3.60	$14.95	$18.55	$32.95

[A]Actual on-peak hours vary by service, but they tend to represent normal business hours. [B]Hourly rates for CompuServe apply only to extended services. You can access core areas for no hourly charge. It costs 15 cents to send or receive each Internet message. [C]Delphi has two pricing plans: the 20/20 plan costs $20 for 20 hours of use, plus $1.50 per additional hour. The 10/4 plan costs $10 for 4 hours of use, plus $4 per additional hour. Access to Internet services costs $3. Most Delphi users pay a $9-per-hour SprintNet charge for on-peak use. [D]Prodigy's hourly rates apply only when accessing extended services. The monthly fee includes 2 hours of access to those services.

of 1994. Today, Mac-using members can receive Internet mail, but not send it. Prodigy hopes to introduce full Internet access—including FTP, Gopher, and Telnet—later this year.

Some regional or special-interest services also offer Internet access. For example, one option is The WELL (Whole Earth 'Lectronic Link, 415/332-4335), a San Francisco Bay Area–based organization that has bulletin boards, a software library, and full access to the Internet. The WELL is popular with Bay Area residents, and its bulletin boards feature spirited discussions on political and social issues. But navigation is complicated, and accessing The WELL from outside Northern California is expensive.

Another online service is Women's WIRE (Worldwide Information Resource & Exchange; 415/615-8989, 800/210-9999), an Internet-providing bulletin board for women. WIRE is based on SoftArc's FirstClass, an excellent graphical bulletin board software product. WIRE contains information and discussion boards on a variety of topics, including news, health, arts, and technology. Organizations like the Boston Women's Health Book Collective and chapters of the National Organization for Women have folders on WIRE. Introduced earlier this year, Women's WIRE grew to over 650 members by the middle of March. Considering that more-traditional online services' members tend to be mostly men, women may find WIRE a welcome change. (To read about other BBSs, see *The Desktop Critic*, in this issue.)

Adding Up the Costs

The costs of online services vary widely, depending on access speed, time of day, and services used. Most services charge a regular rate for core services and charge additional fees for extended or premium services (see the chart "How Much Do Online Services Really Cost?").

AOL, eWorld, and GEnie have fixed hourly rates, while CompuServe and Prodigy charge an hourly fee only if you're using an extended area. In February, CompuServe cut its prices by 40 percent, significantly lowering its overall costs. Now, most of the good stuff on CompuServe costs you $4.80 or $9.60 an hour, depending on your access speed; for $8.95 a month, using only the core services is cheap, and accessing the extra services at 2400-bps is fairly reasonable. In contrast, eWorld's hourly rates apply at all times, so daytime users pay $7.90 an hour for access, regardless of connect speed. The true effect of this pricing structure may be that eWorld is one of the most expensive services around.

On Prodigy, accessing all but four areas costs nothing more than the monthly fee of $14.95. Users pay the hourly rate for accessing bulletin boards, stock quotes during trading hours, company news, and airline reservations. Prodigy is the only service that places advertisements on its screens, which may keep its costs low.

Delphi offers two payment plans. To get the best deal, you need to predict how many hours you're likely to use the service each month. Delphi's 10/4 plan costs $10 for 4 hours of monthly usage; the 20/20 plan costs $20 for the first 20 hours. Enrolling in Internet services (as most users will want to do) costs an additional $3 per month, Sprint's $9-an-hour phone charge applies during business hours. If you use Delphi in the evening, the price is right, but if you're a business user, the phone surcharges may make the cost prohibitive.

How to Ride the Internet

The Internet is a lot of things—President Bill Clinton and Vice President Al Gore's "data superhighway," a fast international post office, a file library, a bulletin board, a newsletter, a conference center, as well as a big database.

The Internet is a tremendous network of networks, connecting more than 1.7 million computers all over the world. Some are personal computers, and some are mainframes located at large educational, corporate, or government institutions. You can use the Internet to send electronic mail, access databases, retrieve files from all over the place, have conversations online, and participate in discussions on a variety of subjects.

Every person on the Internet has a unique user name, the components of which usually indicate the user's identity and the organization providing access. For example, the user name *whoever@aol.com* shows the user's name, the service providing access (America Online), and the category of service. The *com* in the Internet address above means the address is accessed through a commercial service. Other three-letter suffixes indicating the organization type are *gov* (government), *mil* (military), *edu* (educational), *org* (organization, usually used for nonprofits), and *net* (network).

How do I get on? Types of Internet access vary. The most complete and expensive Internet access is dedicated access, requiring a phone line and a routing computer. Dedicated access is best for large institutions that have the money and resources to devote to Internet upkeep. If your organization has an Internet connection (as many corporations, government organizations, and schools do) but you don't have access, talk to your network administrator.

If you're an individual who wants Internet access, you can get an account on a commercial Internet service provider, like Netcom, or you can purchase a more direct account, called a SLIP (serial-line Internet protocol) or PPP (point-to-point protocol) account, also from an organization such as Netcom. An account from a commercial Internet service provider may cost between $15 and $50 a month; an account on Netcom could cost more than $100 a month. A dedicated connection (providing you with the ultracool *your company*.com suffix on your E-mail address) can cost thousands of dollars annually.

Using the Internet means using some Unix commands, but there are a few programs that provide easier Internet functionality for Macintosh users. One is Mosaic, a free product from the University of Illinois's National Center for Supercomputing Applications. But you can't use these products unless you have a SLIP, PPP, or more direct dial-in account.

Spry Inc. is working with book publisher O'Reilly & Associates on a product called Internet in a Box, which will provide users with graphical Internet applications, an opportunity for an Internet account on NovX InterServ, and a special edition of Ed Krol's *The Whole Internet User's Guide and Catalog* (see "Internet in a Box . . . ," *News*, July 1994). A Mac version of the product is expected later this year, and will cost about $100. Ventana Media offers a similar product, the $70 Internet Membership Kit (919/942-0220), providing two books and access via CERFnet.

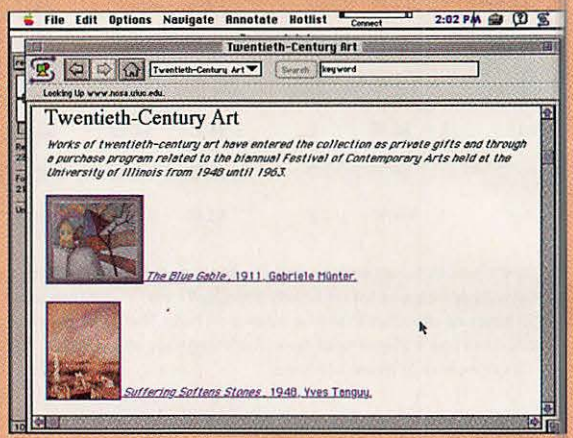
Sending mail To send mail to someone on a commercial online service over the Internet, you need to append routing information to the person's E-mail address. For example, a CompuServe user's Internet E-mail address is *username*@compuserve.com (CompuServe's user names include a comma, which you should replace with a period; such substitutions are not needed for other services).

Some businesses set up Internet mail gateways through office E-mail systems; these addresses can get quite complicated, and it's best to have the user E-mail you first so you can just copy the address into a macro or address book.

Users with Internet access can usually send files to others on the Internet; receiving those files usually means dealing with your telecommunications software's file-transfer protocols (see "Pick the Right Communications Software," elsewhere in this issue).

To cut down on connect time, you can use the Eudora Internet mail program, if you have a SLIP or PPP account. A free version is available on the Internet, and Qualcomm (619/587-1121) sells a version with more features for $50.

File transfer Internet also lets you transfer files using various commands. In Internet lingo, you use FTP—it stands for File Transfer Protocol, and it's used both to identify the protocol and to indicate using the protocol. You can log in to an FTP site, browse files, and download them, which involves transferring them first to your Internet account and then to your own computer. You don't need your own account at the FTP site; many let you use *anonymous* as your user name and your E-mail address as a password. Because some Internet service providers charge users for disk space, FTP may involve extra costs if you transfer large files.



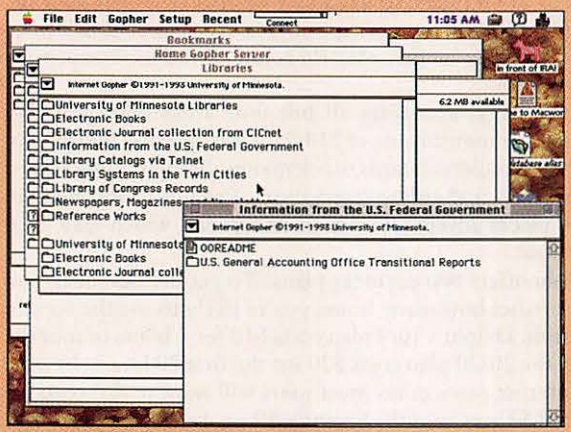
User-Friendly Internet Mosaic, a hypertext Internet browser, displays pictures and lets you navigate by clicking the mouse. Here, Mosaic is browsing the collection at the University of Illinois's art museum.

You can FTP via telecommunications software, or try an FTP-specific program like Fetch, written by Jim Matthew of Dartmouth College. The program is free to noncommercial users and costs $25 for commercial folks. (For information, send E-mail to fetch@dartmouth.edu.)

FTP files are usually free. You can FTP files from Apple, the National Institutes of Health, the Internet Network Information Center, the National Science Foundation, and various literary archives, just to name a few—there are thousands of FTP sites.

Don't know where to find a file you want? Archie will tell you. Archie puts a list of FTP files into one database on a server, and lets you search for files easily. There are Archie servers all over, and you can access them via E-mail, Telnet (explained later), and on GEnie and Delphi.

Similar to FTP, Gopher lets you find and retrieve remote files. But unlike FTP, Gopher



Gopher by Mouse The University of Minnesota's TurboGopher comes preconfigured to access Gopher servers in a Mac-like folder hierarchy. Unfortunately, TurboGopher is very slow, even at 9600 bps.

connects to the host site only to retrieve menus of information and disconnects for browsing, whereas FTP remains connected the entire time. One Mac Gopher program is the University of Minnesota's TurboGopher (free from several servers), which acts as a client to Gopher servers. The Archie of Gopher is called Veronica. Veronica is an index of Gopher archives and can be reached on Gopher servers.

Remote log-in The Telnet command lets you log in to another machine remotely. You might log in to a remote computer to search a database or log in to another account on the Internet. Telnet is particularly helpful if you have an account in another city, because you can log in remotely to save phone charges.

Newsgroups Usenet (also called Net News) collects received messages (or articles) on a particular subject and sends them to a mailing list. There are lists for every topic under the sun.

File searching WAIS (Wide Area Information Server) lets you search files based on content, giving commands as colloquial as "tell me about AIDS treatments." You can use Telnet to connect to a WAIS or log in to one directly using WAIS client software.

Service providers If you send E-mail to the following addresses of a cross section of Internet service providers, you'll receive a reply with information about pricing, availability, and connection instructions.

Among nationally available providers are Advanced Networks and Services (313/663-7610, info@ans.net), Delphi (617/491-3342, 800/695-4005; info@delphi.com), and Netcom On-Line Communications Services (408/554-8649, info@netcom.com).

Among regional providers are Colorado SuperNet (303/273-3471, info@csn.org), Holonet (510/704-0160, info@holonet.net) in the San Francisco area, and The World (617/739-0202, info@world.std.com) in the Boston area.

Resources Because the Internet is sprawling and largely unmanaged, it's hard to get a handle on how to use it effectively. Fortunately, there are some good resources to help you navigate it. One of the best is the Internet Network Information Center (619/455-4600, 800/444-4345). Your local user group may offer Internet access.

Your local bookstore may have lots of books on the subject. My three favorites are Bernard Aboba's *The Online User's Encyclopedia* ($32.95, 1993, Addison-Wesley Publishing Company, 617/944-3700, 800/822-6339), Adam C. Engst's *The Internet Starter Kit for the Mac* ($29.95, 1993, Hayden Books, 317/581-3500, 800/428-5331), and Ed Krol's *The Whole Internet User's Guide and Catalog* ($24.95, 1992, O'Reilly & Associates, 707/829-0515, 800/988-9938). Aboba's is best for information about all things telecom, while Engst's comes with several pieces of TCP software. Krol's book has fewer lists but remains an excellent resource.

Interface Issues

When you do join a service, you're adopting a culture, and it can take a while to get acclimated.

America Online AOL feels like a Mac environment, from the menu and icon-driven interface to the friendly voice that announces "You've got mail."

America Online recently added more E-mail functionality, so that members can now mark already read mail as unread so it remains in the box, as it were, and can unsend mail already sent to AOL users. eWorld has some of the same abilities, but AOL's prices give it a significant edge.

AOL looks and behaves like a Macintosh program should. Each area has a designated keyword, and getting around is as easy as typing ⌘-K and then the keyword. But while getting to an area is easy, getting *around* it isn't—arrow keys work for navigating some things, but sometimes there's no alternative to clicking on buttons.

Another problem with American Online is its inability to search message boards based on content, or to do threading (navigating through related topics). You can read only messages posted since you last visited the area or in the last *x* number of days. If you want to read everything, that's great, but if you just want to find an answer to your question, patience is helpful. Having to read entire blocks of messages also increases the cost of AOL, since you spend more time looking for what you want than you would if you could search for it by keyword.

Delphi is the only service offering full Internet access ✻

Earlier this year, AOL users experienced problems with logging on and slow performance, and those connection problems continued for some users in large U.S. cities in late May, partially because of problems with Sprint, a company providing local access numbers. Pam McGraw, spokesperson for America Online, said there are isolated instances where subscribers are experiencing difficulties at the local-access level. "We're continuing to work to resolve those issues," McGraw said. The service's checkered history does not inspire confidence. Still, AOL's friendly organization makes adjusting to the service fairly easy.

CompuServe CompuServe looks and feels huge, and it can be reached through either of two graphical software packages: CompuServe Information Manager (CIM) and CompuServe Navigator. Users can also access CompuServe in text-only format from any standard telecommunications program, but unless you're a masochist, there's no real reason to do so, since CIM comes with CompuServe's $39.95 starter kit. CIM version 2.3 provides a Microsoft Word–like tool bar for frequently accessed functions like mail, searches, weather, Go words (the commands to move to a specific part of the service), and connecting. CIM also provides a "favorite places" list that makes for easy navigating.

But CIM's keyboard equivalents are also limited—the Find command isn't even assigned to the Mac's standard ⌘-F. Not all of CompuServe's areas support a graphical interface, and CIM is smart enough to switch to a textual interface when necessary. However, switching between CIM's terminal emulator and the graphics software can be confusing.

The other graphical navigation option, Navigator, is a complex program whose main purpose is to retrieve information to be read offline. Users can tell Navigator to log in to CompuServe, get mail, read particular message boards, search software libraries, and log off. The user can then read the Navigator log, which contains the information that Navigator retrieved, without incurring access fees while reading. Navigator is far

more sophisticated than any other online-service software I have seen, and while it is expensive ($50 to $70, depending on current CompuServe specials), a serious CompuServe user won't want to be without it.

Despite its sometimes awkward graphical interface, CompuServe excels in its ability to search data. CompuServe's search options include location, text string, and date, making it very easy to find what you want. Searching for information about bugs in your new software? Just type **bug** and select the vendor forum and the appropriate date, and CompuServe shows you all the relevant messages. You can also hit a map button that displays a hierarchy of messages and their authors.



Help on the Way Macintosh users can exchange tips, get technical suppport, and download software from Apple in the company's Customer Center on eWorld.

Delphi I found Delphi easier to navigate than any other text-based service I've used. Delphi is organized by menus, and a user can type the first few letters of an item to select it. Unlike other services, where commands differ depending on the part of the service you're using, Delphi responds to logical commands, and online help is easy to find.

Like CompuServe, Delphi can follow messages according to topic, but unlike with CompuServe, you can't search areas for keywords or dates. Reading Delphi message boards can take some getting used to, but the information tends to be useful. If you can't live without a pretty interface, Delphi isn't for you.

eWorld Built with software from America Online, eWorld looks and feels very much like AOL but with reorganized menus and different fonts. As in AOL, getting around eWorld can be a pain, since users often have to click through several screens to get to their destination. eWorld's graphics are rich and colorful, but as a result the software takes up over 3MB of disk space—almost twice as much space as other services' software. eWorld will eventually replace AppleLink, and since Apple plans to make eWorld software a part of every Mac-and-hard-drive bundle it sells (starting no later than July), the service's membership may grow quickly. For eWorld, the test will be not how many people get memberships, but how many people keep them.

GEnie While GEnie offers good information, it's an ASCII-based service—the introduction of long-promised graphical software has been delayed repeatedly. Because GEnie is text-based, you can access it from any telecommunications program.

GEnie's organizational metaphor is a book, and areas are located on particular pages. To move to a certain area, a user types a forum name or, in some cases, **Move** *page number*. Within areas, topics are organized by categories, and navigating the categories is sometimes difficult. Members can't search message boards by content; as with America Online, GEnie users can select messages based only on criteria such as posting date.

Prodigy The Prodigy online service is fairly easy to navigate: a tool bar at the bottom of the Prodigy screen lets you get to the main menu quickly. Prodigy uses "Jump" words that are equivalent to AOL's keywords and CompuServe's Go commands. Unfortunately, like AOL and GEnie, Prodigy can't do message-threading.

While navigation is mostly simple, accessing Prodigy from a Macintosh is a pain. The Mac version of Prodigy has an atrocious interface. For example, because Prodigy uses enormous screen fonts, users often have to move through several screens to read an entire message, and there is no cut-and-paste.

This August, Prodigy expects to ship a new version of Mac software. I looked at a beta version of it that allows access to other applications and offers cut-and-paste capabilities, but still doesn't follow basic Mac software-design guidelines. Prodigy representatives said that they just didn't feel it was worth the effort to create a Mac interface.

What's Right for You

Commercial online services offer hundreds of services, and it's unlikely that you'll want—or use—all of them. In picking an online service, consider what you'll use it for most. If you want access to particular computer vendors, first determine whether they have their own bulletin-board system (their manuals usually tell you). Your local user group may also have a BBS that provides technical support and Internet access. (To find a local user group, call Apple's user-group hotline at 800/538-9696, ext. 500.) America Online and CompuServe have the most Mac vendors online. All services are good sources of news and financial information, and America Online's E-mail is cheap, easy-to-use, and reliable.

If you are having trouble deciding between services, see what specials they are offering. America Online and Delphi regularly advertise free trial memberships. Apple offers free eWorld software, but no free access time. If you are considering CompuServe, determine whether the areas that you will use most are going to incur CompuServe's hourly fees. CompuServe is a good choice for users who need reference materials, while the best choice for E-mail is America Online. Both services' Mac resources are excellent. Users seeking Internet access may want to use Delphi in the evening or get an account through an Internet service provider.

If you can afford it, you should try out a few services. The one you wind up using most is probably best for you. ■

Online Services

MW EDITORS' CHOICE

To pick the top online services, we gave the most weight to the breadth and depth of information, with emphasis on a Macintosh owner's needs, followed by price and ease of use.

E-MAIL

America Online Relatively cheap and easy to navigate. America Online is the best choice for E-mail users. Company: America Online. Basic monthly fee: $9.95.

REFERENCE

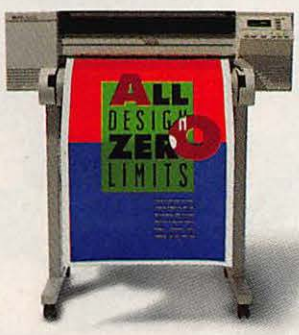
CompuServe With graphical software and new lower prices, CompuServe is the best choice for users seeking reference materials. Company: CompuServe Information Service. Basic monthly fee: $8.95.

JOANNA PEARLSTEIN, a *Macworld* assistant editor, is a frequent contributor to the reviews and news sections of the magazine.

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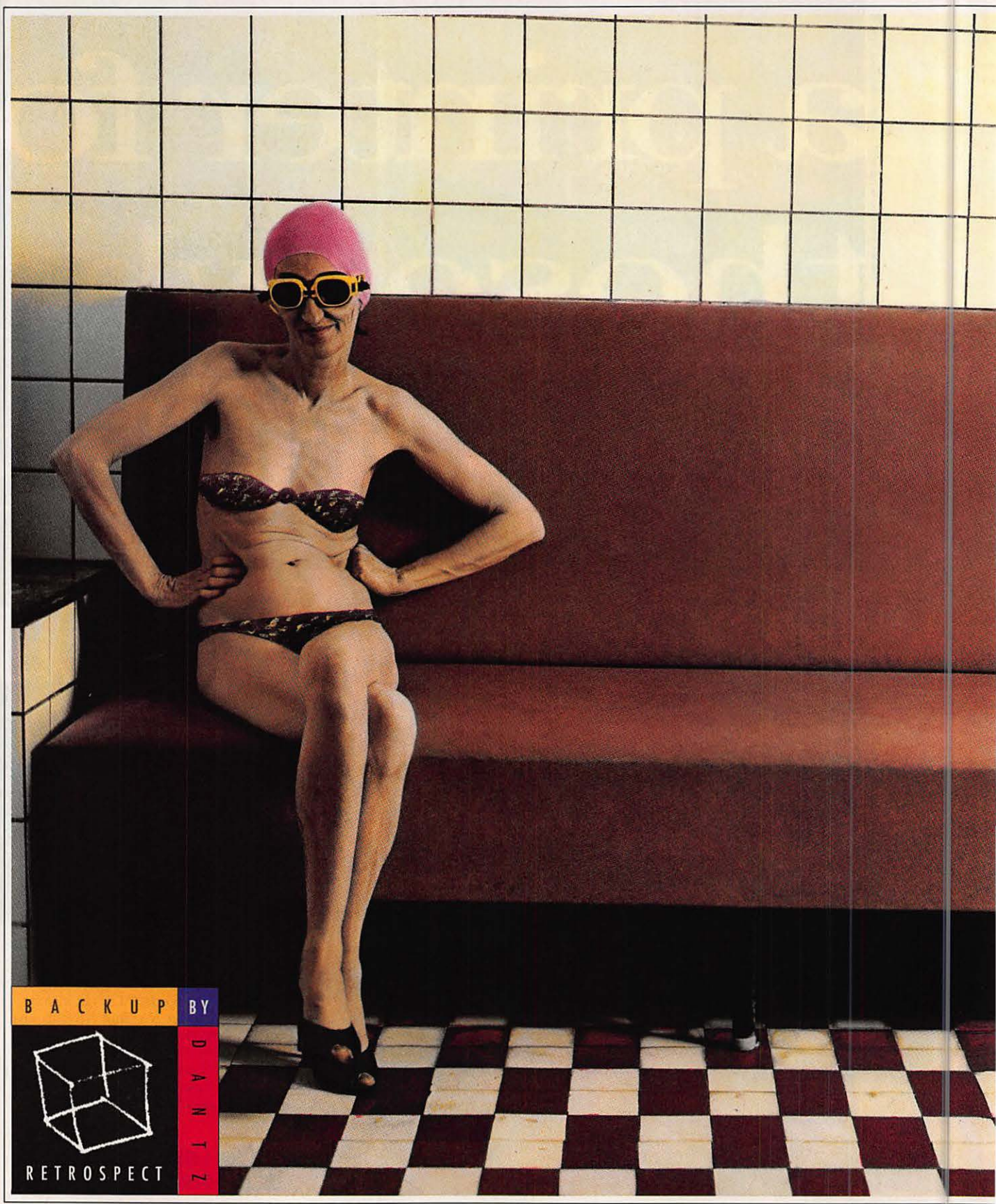
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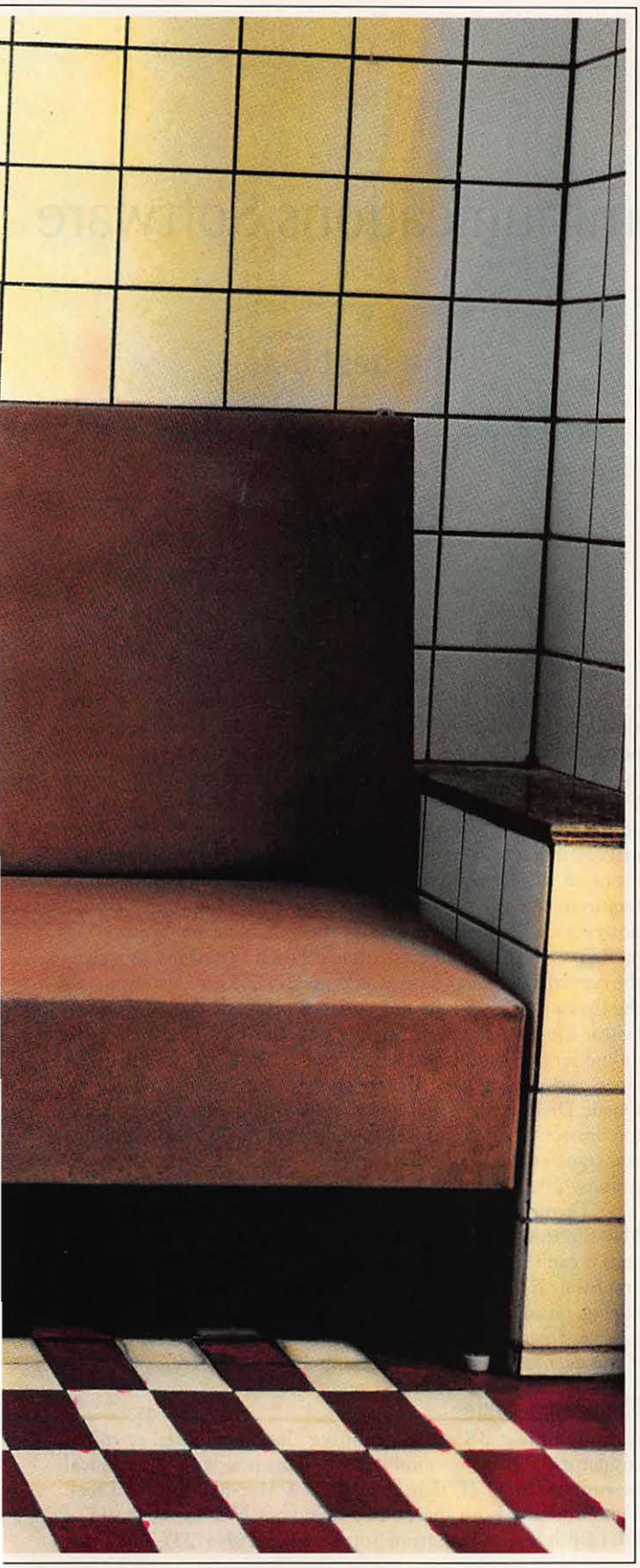
Circle 11 on reader service card

*Suggested U.S. list price. **Larger model lists at $11,595. †Pantone, Inc.'s check-standard trademark for color. Adobe and PostScript are trademarks of Adobe System Inc. which may be registered in certain jurisdictions. ©1994 Hewlett-Packard Company PE12410

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RETROSPECT HAS SWEPT THE TOP INDUSTRY AWARDS. From the MacWeek Diamond Award to the coveted MacUser Editor's Award. So whether it's for a single user, or an entire network, Retrospect will keep you covered. And at a price you can afford—less than $200 for individuals, a bit more for networks. To learn how Retrospect can help you, visit your local dealer. Or call Dantz at **1-510-253-3020** to receive a free copy of our white paper: Backup—Personal Computing Insurance.

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SO YOU BOUGHT A HIGH-SPEED MODEM, ONE OF THOSE 14,400-bps items that are so cheap nowadays, and logged some time on simple communications: faxing friends, dabbling with the America Online trial package, and looking at Dow Jones quotes for stock you'll never buy. Now you're eager to do some real work—

Pick the Right Communications Software

The best bets for making the online connection

telecommute from home to the office mainframe or set up a customer-support BBS for the service department. Plus, with this speedy modem now fully operational, you're just dying to try out that precursor to the information superhighway, the Internet.

Your modem gives you easy access to all of these: bulletin boards by the thousands, commercial information services, mainframes and minicomputers, and gateways to the Internet. As with all of life's journeys, you need to equip yourself for the trip, which means choosing the right software. The choices you make depend on how far you want to travel and what you want to see along the way. You have to weigh features such as protocols, terminal emulations, file-transfer support, and scripting capabilities. If your communications needs are limited to online services, such as America Online or CompuServe, you can probably get by with the software that came with your modem (see "*Macworld*'s Guide to Online Services," elsewhere in this issue). But if you want to communicate with the rest of the world, you need more. The following guided tour surveys the most popular Mac communications packages, helping you pick a package that matches your budget and digital itinerary.

ONLINE SPECIAL REPORT

Zimply Ezzential

Bulletin board systems (BBSs) are like the swap meets of the global village: people of like interests meet to exchange war stories, advice, and tangible goods. You can find a BBS for virtually every special interest, from aviation to zoology. You can even set up your own BBS for others to access; all you need is a modem and BBS host software.

Accessing most BBSs requires only a simple terminal emulator with file-transfer capabilities for uploading and downloading files. One inexpensive product fills this role perfectly: ZTerm. This $30 shareware gem by David P. Alverson (5635 Cross Creek Ct., Mason, OH 45040-2448; CompuServe: 72155,1560) is a well-outfitted, finely crafted terminal emulator for exploring the vast network of BBSs that now stretches across North America (see "Two Bulletin Board Systems"). You can download ZTerm from any major online service and many BBSs, or for an extra $10 get the latest version on disk directly from the author (mail orders only—no phone calls, please). ZTerm supports communication speeds up to 57,600 bps, to take full advantage of the compression capabilities of high-speed modems; VT100 and PC-ANSI terminal emulation (used by most BBSs); automatic log-in for one-step dialing and sign-on; keyboard macros; and a reasonable suite of file-transfer protocols. A wide range of file-transfer protocols is one of the most important requirements in a program designed for BBS hopping, because not every BBS supports every protocol. ZTerm supports Xmodem and Ymodem protocols in all their variations, as well as the currently popular (and fast) Zmodem. ZTerm also supports the CompuServe B-Plus and Quick-B protocols, which give the fastest file-transfer performance possible with CompuServe's online service—important when you're using the extended services and paying connect charges by the minute. ZTerm's Queue Dialing command lets you repeatedly dial a list of BBSs to connect to the first one that becomes free. ZTerm also lets you transfer files in the background while you use other applications, albeit with lower file-transfer throughpu

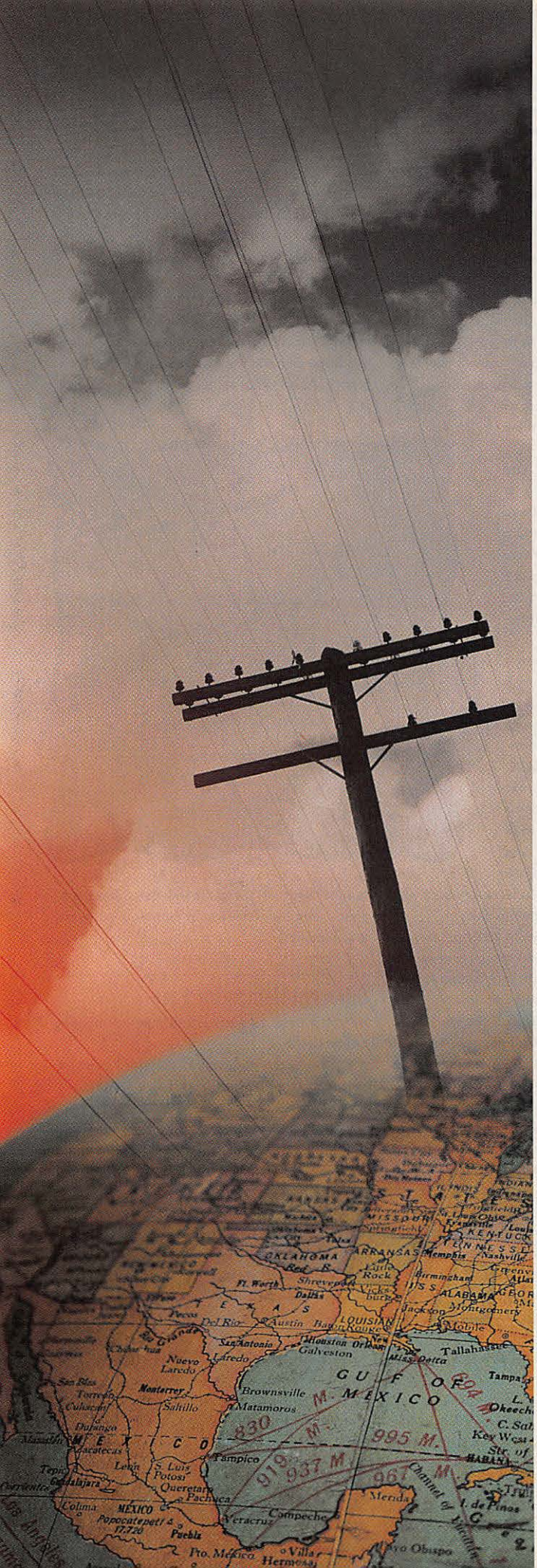
ZTerm is a great low-cost tool for BBS work and Mac-to-Mac file transfers, but it has its limits. While it supports color text, it can't send and receive graphics, and its interface is nongraphical. ZTerm's scripting is simple and limited to automating log-on and log-off, and ZTerm provides no support for multiple sessions. Even so, ZTerm should be in your travel kit even if you eventually opt for something more expensive.

The Scenic Route

Although most BBSs use primitive character-based terminal emulators, a growing number of systems now offer a graphical user interface (GUI) that gives them a Mac-like look and feel. Two products, both shareware, open your Mac to the world of GUI BBSs: FirstClass, from SoftArc (416/299-4723), and Tele-

by Mel Beckman

Illustration by Will Crocker



Finder Pro, from Spider Island Software (714/669-9260). Currently, FirstClass has more than 500 BBS sites in existence; TeleFinder has about 100. Both products consist of two parts: server software that runs on the actual BBS host system ($95 for FirstClass, $425 for TeleFinder), and client software that a caller uses to connect to the BBS. SoftArc and Spider Island make their money selling the server piece to BBS operators, which is why the client piece is distributed for free (or nearly so) to users through online services and BBSs.

A growing number of BBSs now offer a graphical user interface

Both products support file archives, discussion boards, real-time conference areas, and gateways to other systems and networks, all of which are represented by icons. In this way they are similar to the graphical front ends for CompuServe and AOL. The critical difference is that you can connect to a wide range of BBSs rather than a single commercial service. Which product you choose depends on which BBSs you want to use; you must use client software that matches the server software.

In both programs you can open multiple windows to access several online services at once. FirstClass offers a purely modeless interface, meaning you can do any number of things at the same time (see "Two Bulletin Board Systems"). For example, you could be downloading one or more files while simultaneously browsing a message base and monitoring a real-time conference. With TeleFinder you can do only one online thing at a time. Both products let you use other Mac applications while downloading files in the background. TeleFinder's interface mimics the Mac Finder, with icons for both disk volumes and online services sitting on a desktop—an arrangement that some people find confusing. FirstClass organizes its icons in windows without changing your desktop's appearance.

The FirstClass and TeleFinder server components turn your Mac into a complete BBS. The price of server software depends on the number of simultaneous users you want to support—anywhere from a few hundred dollars to $1000 or more. Many Mac vendors and user groups use FirstClass or TeleFinder for customer-support BBSs.

Road Warriors

Sometimes you may want the Mac to run routine online chores automatically. Perhaps you need to retrieve your E-mail from an online service at regular intervals throughout the day, or transfer large files at night when phone rates are lower, or collect hourly stock quotes to import into a spreadsheet. Such tasks require scripts that tell the communications software what to do and when to do it. For scripting capability, you need to step up to the next level of communications software.

The Mac market is replete with scriptable comm programs, but a few stand out for their combination of simplicity, power, and value: Crosstalk for Macintosh ($195, Digital Communications Associates, 404/442-4000), MicroPhone II and MicroPhone Pro for the Macintosh ($195 and $295, respectively, Software Ventures Corporation, 510/644-3232), SmartCom II ($149, Hayes Microcomputer Products, 404/441-1617), and VersaTerm ($125, Synergy Software, 215/779-0522).

For the price, VersaTerm is hard to beat. You can create scripts automatically by having VersaTerm observe your actions and record them for later playback. VersaTerm supports X-modem and Ymodem file-transfer protocols, but strangely, not Zmodem, an omission that doesn't rule out file transfers to a given service, but does mean slower transfers. If you connect with Unix systems, you'll be glad for VersaTerm's Kermit and

How to Buy a Modem

A modem is the most cost-effective enhancement you can buy for your Mac system. If your work requires current financial, legal, or medical information, your modem can actually be your main justification for owning a computer. But even if you only download software occasionally through national online services such as America Online and CompuServe, your modem will quickly pay for itself. And a fax modem lets you avoid paper-based clutter and the ridiculous intermediate step of printing a computer document before sending it to someone else's computer. And as faster modems make transmission times negligible, even for large documents, telecommuting becomes possible for a wider range of jobs. A modem now makes sense for almost every Macintosh user, so the real question is: how much speed do you need to buy, and for what price?

Buying a modem is more confusing than adding memory or a new printer. Manuals for modems tend to feature cable-connect pinouts, timing diagrams, arcane CCITT jargon, and tables of the time-honored Hayes AT commands. If you have to deal with modem communications at this level, you'll wish you had an electrical engineering degree. Here's some advice on buying a modem and on choosing software that lets you dodge most of the technicalities of modem set-up and operation.

The Works

A modem's job is really fairly simple: it takes the digital output from your files or your keyboard and transmits it via telephone lines as a pattern of tones (a fax modem scans a document and translates the light and dark patterns into tones that it then transmits across the lines). The circuits that do this conversion have only one or two chips, so the price of modems falls steadily.

Let's review the options for modem hardware currently available. Then I'll make some buying recommendations.

Five Ways to Go

OLD, SLOW, AND CHEAP There are millions of old 1200-bps modems floating around, and it's often possible to cajole someone into giving you an old unit. Don't buy one, though.

FASTER BUT STILL CHEAP Many vendors offer plain old 2400-bps modems (no fax capability) for basic communications, and these modems can often be found bundled with introductory offers for subscriptions to national online services.

BASIC FAX Standard fax modems, offering 9600-bps fax and 2400-bps data communications, are available at street prices ranging from $100 to $160. Some offer extra amenities: the Home Office 144e ($269 list price) from Prometheus Products, for example, includes a voice-messaging system; and it works with your phone over a single phone line, instead of requiring a dedicated line for fax transmission.

Apple bundles the Global Village TelePort/Bronze fax modem with midrange Performa models. If you are thinking of buying a new Mac, this is a way to get a fax modem at a good price and to avoid set-up hassles, as the included software handles the details.

RIGHT HERE, RIGHT NOW If you regularly telecommute or download remote database data, you need a fax modem that offers 9600-bps data transmission and 9600-bps fax, such as Global Village Communication's TelePort/Silver and PowerPort/Silver.

Modems that transmit data at 14,400 bps and also have 14,400-bps fax send/receive capability are beginning to supplant 9600-bps modems. The SupraFaxModem 144LC, selling for $189.95, for example, includes V.42bis compression, permitting E-mail throughput at 57,600 bps. And at this price, it's hard to make a case for a slower modem, at least for users who connect for more than an hour a day.

CompuServe now has 14,400-bps dial-up numbers in large cities, and other services will follow soon. The 14,400-bps speed itself will be old news in a year or so, but right now there are few services that accommodate faster standards.

MODEMS ON THE MOVE Very small portable external modems (pocket modems) for PowerBooks offer the advantage that you can unplug them and use them with a desktop Mac. One particular performance bargain, Bay Connections' SpectraCom P1414 ($249 list price), offers 14,400-bps data and fax transmission and V.42 compression.

Do This

GET THE FAX Vendors have pretty much stopped making modems without fax capability, since fax adds almost nothing to the modem's cost.

BUY SPEED If you're going to be playing interactive games or corresponding in real time and little else, modem speed isn't an issue. Typing 50 words per minute clocks out at about 5 bps, making 2400-bps modems more than adequate. But for downloading files from online services, speed makes a critical difference when you start to total up your connect charges. In fact, 9600-bps data access is still a real bargain. For the few dollars required to make the jump from 2400 bps to the next common speed, 9600 bps, you get a fourfold speed increase; another 20 to 30 percent increase in price gets you to the next level, 14,400 bps.

Decision Time

The appropriate choice for most casual users will be a 9600-bps fax/2400-bps data modem, or a 9600/9600 unit for users who anticipate needing to do both file transfer and faxing in a business or home-office setting. Since the software is independent of these speed considerations, check out the reviews of bundled software independently.



PETER ALSBERG

Different Names for Fast

Here's a brief explanation of current modem terminology.

- V.32 A communications standard used for most popular 9600-bps data transfer.
- V.32BIS A communications standard generally used for 14,400-bps (14.4-Kbps) modems.
- V.32TERBO A standard for 19.2-Kbps data transfer. This standard is not as widely accepted by modem vendors.
- V.FAST A standard for 28.8-Kbps data transfer (a neat 24 times faster than your old 1200-bps unit). V.Fast modems cost about twice as much as V.32 modems and will for the next year or so.
- V.42BIS A compression standard that speeds data transfer (at least to other V.42-capable modems) by a factor of four.
- V.29 The most widely accepted standard for 9600-bps fax transmission. Since this speed is typical of millions of stand-alone fax machines, V.29 will be around for a few years.
- V.17 The standard for 14.4-Kbps data transfer, emerging as the most popular choice in computer-to-computer faxes.

by Charles Seiter

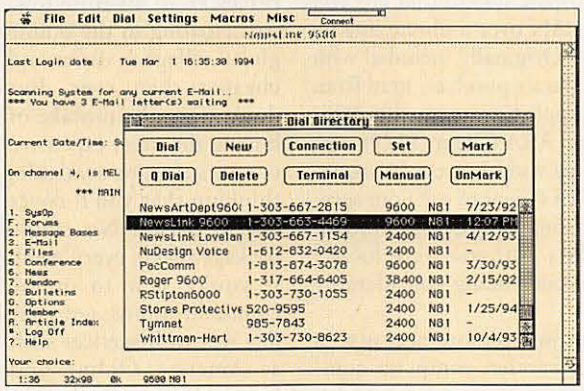
TCP/IP FTP protocol support. Terminal emulations include DEC VT100 and VT220, Tektronix Tek4014, and Data General D200, along with keyboard layouts for DEC, IBM, DG, and Unix systems. You can use these emulations to exchange E-mail and data with your corporate mainframe. VersaTerm supports multiple simultaneous connections over serial lines (with several modems) or via AppleTalk or TCP/IP networks. A server feature lets VersaTerm users on an AppleTalk network access other networks through a gateway Mac. The emulation is fast, able to keep up even on high-speed connections. Inconveniently, however, VersaTerm lets you view only one network connection at a time, even when several are active.

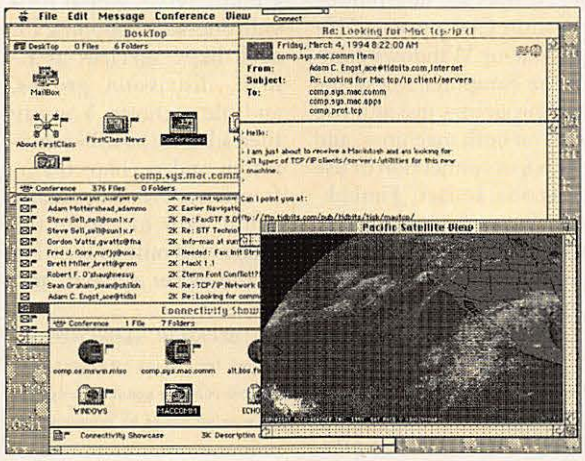
While VersaTerm's recording feature simplifies script creation, the script language itself is cryptic; its special characters and control sequences are impossible to grok without serious study of the programming manual. If you plan to create and maintain a lot of scripts, consider the pricier MicroPhone II or MicroPhone Pro. Both let you create scripts using the Watch Me command—and then view those scripts in something akin to English (see "Power Communicator"). You edit scripts with a syntax-sensitive editor that lets you choose script statements from a scrolling list and then prompts you for statement arguments. Instant syntax checking prevents grammatical errors. You can create button palettes to let users invoke scripts with a single mouse-click. In addition to better scripting, MicroPhone II supports Zmodem and CompuServe Quick-B file-transfer protocols, and VT320 and PC-ANSI terminal emulations, none of which VersaTerm handles. For $100 more, MicroPhone Pro adds TCP/IP Telnet, FTP, and Usenet news client programs and fax send-and-receive software. But buy only the features you need.

At $195, the same price as MicroPhone II, Crosstalk offers more-powerful, although more-complex, scripting, and a more inclusive set of terminal emulations and file-transfer protocols than either MicroPhone or VersaTerm. For terminal emulations, Crosstalk adds IBM FFTERM and 3101, HP 700/94, VIDTEX, WYSE, ADDS, and PCTERM. Crosstalk is also the only Mac terminal emulator that speaks the arcane IND$FILE file-transfer protocol used by IBM's IBMLink mainframe network. Crosstalk's scripting is more robust than VersaTerm's but harder to use than MicroPhone's; the package also includes a huge array of script files preconfigured for online services, making good use of an elaborate button palette.

SmartCom II is another specialist's tool. It works extremely well with Hayes modems (not surprising, since Hayes developed it). Its terminal-emulation and file-transfer capabilities match those of MicroPhone II, but the scripting in version 4.0A is icon based rather than text based. The program comes preconfigured for virtually every Hayes modem ever made (with free updates whenever new ones hit the market). If you have a Hayes modem, SmartCom II gets you connected in a snap, though you'll have to live with its limited scripting. If you have a Hayes-compatible modem, SmartCom II provides support for several vendors and dozens of models.

Two Bulletin Board Systems ZTerm (top) gives you all the basics for BBS hopping: terminal emulation, file transfer, and a great dialing directory. FirstClass (bottom) uses icons and windows to put a graphical front end on BBS systems. Its fully modeless interface lets you transfer files while browsing messages, viewing graphics, or searching databases.





Internet Interstate

The Internet global network is a precursor to the anticipated information superhighway that promises to connect everyone to everyone, just as soon as we all get fiber-optic phone service and digital doorbells.

One way to connect to the Net is to use any basic terminal emulator to dial in to an Internet-connected Unix system. (All of the packages described so far are fine for this.) You then type arcane Unix commands such as **ftp, whois,** and **ping** to talk with other computers on the Net. A better Internet connection is something called SLIP (serial-line Internet protocol): you use a SLIP dial-up program to dial in to an Internet gateway and establish a local area network (LAN) interface. Gateways are fee-based services costing between $1 and $4 per hour. A SLIP connection gives your Mac a LAN presence on the Net, just as Apple Remote Access gives you an AppleTalk presence on a Mac network. However, SLIP uses the TCP/IP protocol instead of AppleTalk, so you need Apple's MacTCP extension in addition to a SLIP connection program.

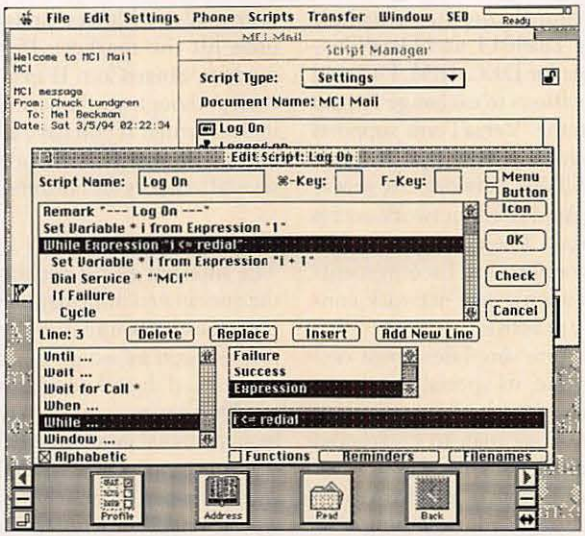
Participating in the online global village is cheaper and easier than ever

Two popular SLIP products for the Macintosh are Versatilities ($95, Synergy Software, 215/779-0522) and TCP/Toolz & Toyz ($149, InterCon Systems Corporation, 703/709-5500). Both contain all the Internet connectivity components you need to get started: MacTCP; a SLIP connection tool; and clients for Telnet terminal emulation, NetNews, E-mail, directory services, and FTP file transfer. Versatilities is bundled with VersaTerm, making that package a real communications bargain for Mac Net surfers. A subset of InterCon's tools is included in Adam Engst's book-and-disk combo, The Internet Starter Kit for Macintosh ($29.95, 1993, Hayden Books, 317/581-3500). The book provides a nice introduction to the Internet; you'll find it useful no matter what SLIP product you ultimately use to tie into the Net.

Once connected via SLIP, your Mac acts as if it were connected over a 100-gigabit-per-second optical cable, only not as fast. Your Mac acts as a full-fledged network, and you can run any number of TCP client programs simultaneously. Client programs let you access services provided (for free) by the many far-flung host systems through-

out the Net—including colleges, libraries, research institutions, software companies, and governments. Typical client programs include Telnet for terminal emulation, FTP for file transfer, and NetNews for browsing the eclectic newsgroup discussions for which the Net is famous. Some client programs, such as the freeware MacMosaic, combine several client functions with hypertext, graphics, movies, and sound to make navigating the Net easier than ever, if no less exhausting.

By the time you read this, at least one other Internet start-up package should be on the market: Internet in a Box (a joint venture of Spry Inc. and O'Reilly & Associates, 707/829-0515, $149). This book-and-disk combination plate includes a number of advanced Internet client software programs, MacMosaic among them, and a subscription to O'Reilly's Mosaic server called Global Network Navigator, which provides a central source for Macintosh Internet news as well as updated software and various network-navigation tools.



Power Communicator MicroPhone's scripting is straightforward and easy to use. Its Watch Me command enables you to build scripts effortlessly, and its syntax-sensitive editor lets you edit scripts using English-like statements.

Other Horizons

Beyond communicating with online services, BBSs, and the Internet, you can use your modem to perform a number of specialty communication chores, such as LAN access, remote Mac and PC control, pager notification, and information services.

The most popular remote LAN access software for the Mac is Apple Remote Access (ARA), a two-part system that lets you connect your Mac to an AppleTalk LAN over a phone line by calling one of the Macs on the LAN. Originally included with PowerBook systems, ARA is now a separate purchase item from Apple. ARA MultiPort Server ($249, Apple Computer, 408/996-1010) runs on the LAN-attached Mac; ARA Client ($129) runs on the remote Mac (and comes bundled with the new 500 series PowerBooks). On the road you use ARA Client to call your server Mac and establish a LAN connection. You then can mount volumes and share programs and data as if you were locally attached to the LAN, the only difference being considerably slower access speed.

Sometimes you want more than just remote access to a LAN—you want to remotely control another computer completely, to provide technical support or operate unattended equipment. Timbuktu Pro ($199, Farallon Computing, 510/814-5000) lets you dial into a remote Mac or Windows computer and observe a verbatim copy of the computer's desktop. You can then manipulate files and launch programs, just as if you were working onsite. You run Timbuktu on both machines, and either establish a dedicated Timbuktu modem connection or use an existing ARA or other network connection. In fact, Timbuktu's connection features are so versatile that you could operate a remote Mac through the Internet, using an Internet-connected TCP/IP LAN, or by dialing into an Internet provider using SLIP. Timbuktu Pro's file-transfer capabilities and support for Apple's PowerTalk mail extensions make it a nice all-around telecommuting package.

Want to give your computer the power to reach out and touch someone? Try Notify ($149, Ex Machina, 718/965-0309), which lets your Mac dial paging services to send wireless messages. Notify works with alphanumeric, numeric, and tone-only pagers, using your modem to send either data or touch-tones to the pager's dial-up line. You simply select a person to notify from a directory, enter a message, and Notify dials the paging service to transmit the message.

A number of specialty information services use dial-up connections to deliver news digests, stock quotes, and E-mail. One such service is Motorola's EMBARC (Electronic Mail Broadcast to A Roaming Computer; $395 plus subscription fees, Motorola, 407/364-3151). EMBARC delivers E-mail, news, and financial information over its pager-size NewsStream radio receiver that you connect to your computer like a modem. The receiver collects messages into its own onboard memory, which you later download into your computer. To send outgoing E-mail, EMBARC dials up a host machine using a regular modem and telephone line. The package includes the NewsStream receiver and special software; you must also pay monthly subscription fees and per-message charges.

End of the Line

With modem speeds at an all-time high and modem prices at an all-time low, participating in the online global village is easier and cheaper than ever. But don't make the mistake of buying the most expensive comm software available, thinking that you'll cover all the bases. No single package meets every need. If you're new to online communications, get your feet wet with services such as America Online and CompuServe, which provide one-stop shopping for such basic services as E-mail, discussion groups, and file archives. You can then advance to BBS exploration and perhaps mainframe access. Eventually you'll want to get on the Internet, if only to see what all the racket is about. **m**

MEL BECKMAN, senior technical editor for *News 3X/400* and communications consultant, spends his waking hours as mbeckman@mbeckman.com.

Communications Software

MW EDITORS' CHOICE

There is no single best communications package—what to buy depends on the kind of communicating you want to do. These are the standout products in the most common categories.

BASIC CONNECTIVITY

ZTerm Every Mac modem jockey needs a copy of David Alverson's shareware program, ZTerm. It's fast, capable, and easy to use—a great lowest-common-denominator terminal emulator. **Company:** David P. Alverson. **List price:** $30.

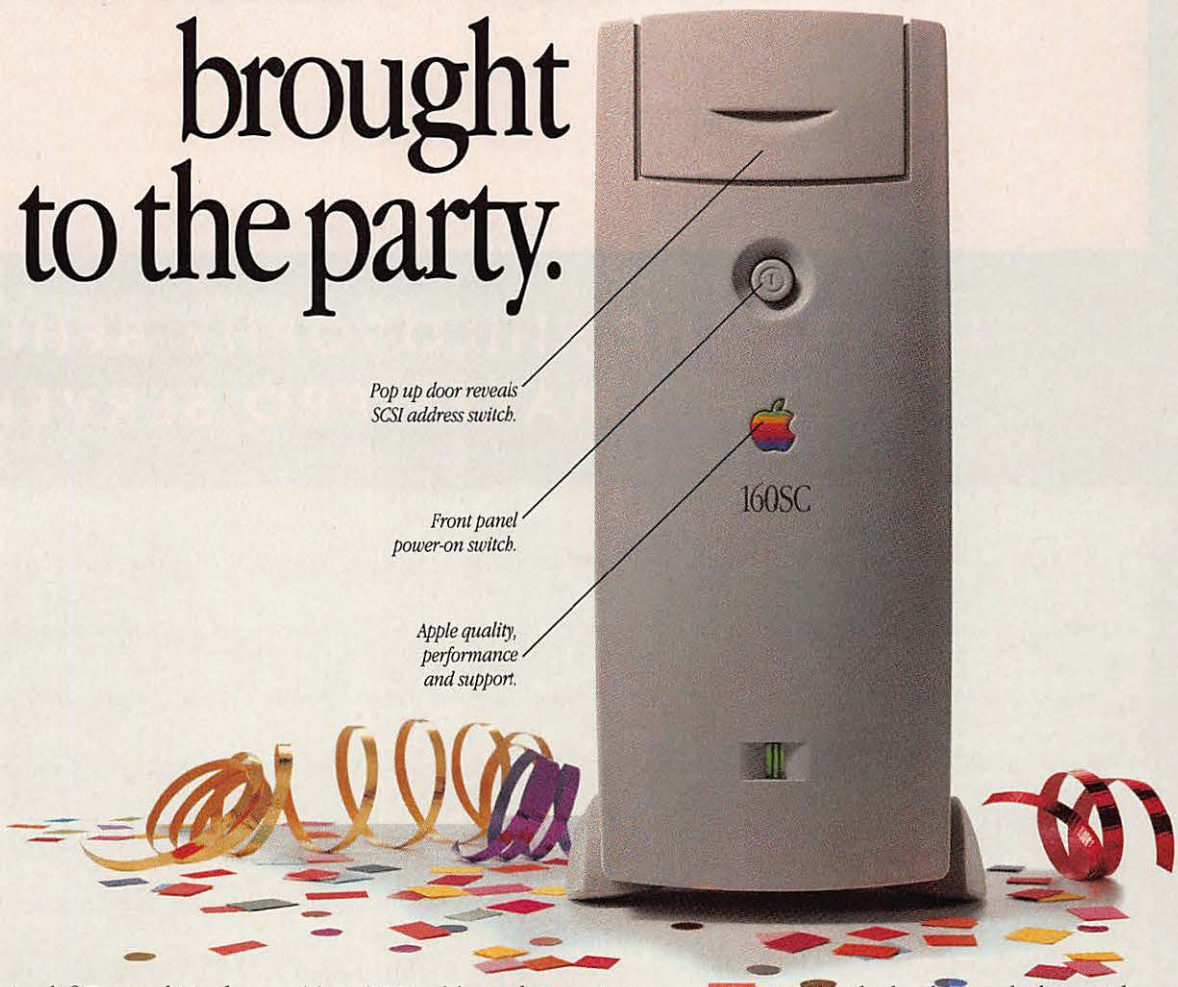
TERMINAL EMULATION

Crosstalk for Macintosh For BBS hopping and mainframe access, you need lots of terminal-emulation options to utilize graphics capabilities and scripting to automate access to each system. Crosstalk has the widest selection of terminal emulators and a power user's scripting language. **Company:** Digital Communications Associates. **List price:** $195.

INTERNET EXPLORATION

VersaTerm This program's combination of excellent Unix-style terminal emulation and the Versatilities collection of Internet tools makes it your one-stop shopping center for Net surfing. **Company:** Synergy Software. **List price:** $125.

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The new Apple drives are available in four convenient storage capacities, 160Mb, 230Mb, 500Mb and 1000Mb, and are manufactured exclusively by La Cie, Ltd. a Quantum Company. And right now we're celebrating the Apple Drive debut by loading each drive with powerful hard disk management software, handy utilities and much more.

Look for the Apple Drive at your local dealer soon. For more information and the name of a participating reseller or Quantum distributor, call La Cie.

Now you can safely store your work outside your Mac without leaving the Apple family.

That's cause for celebration. Apple

For All The Facts Call: LACIE LIMITED A QUANTUM COMPANY 800-999-0499

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Circle 51 on reader service card

THE MORE, T

(THAT'S THE PHILOSOPHY BEHIND NEW FILEMAKER PRO SERVER.)

It may sound like a party, but the benefits are far more substantial. You see, FileMaker® Pro Server lets you and your entire workgroup do more, more quickly. (Not a bad thing to celebrate.)

Maybe your company's expanding, where more users will need to access files simultaneously. Or perhaps you're looking for more power to speed existing operations. FileMaker Pro Server is here, at your service. It's a high performance database engine, designed to dramatically accelerate multi-user file sharing over your network. In fact, its sophisticated client/server technology can speed database performance by up to 100 percent over FileMaker Pro 2.1, and increase multi-user file access from 25 to 100 simultaneous users per file.

Connecting FileMaker Pro Server to your existing network is simple. It can support both Macintosh and Windows users. And while it's compatible with standard Mac systems, including Centris and Quadra, it's also accelerated (native) for Apple's new Power Macintosh systems.

Due to its simple plug and play design, the Server can be run by anyone in your organization, not just network administrators or those with database experience. To begin sharing files, simply take any FileMaker Pro file off a desktop machine and drop it on the Server. You needn't worry about modifications or upgrades. It's all in one box.

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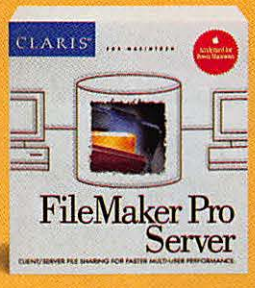
HE MERRIER.

Comprehensive, graphical administration features ensure that the administrator can quickly and easily monitor file-sharing over the entire network, as well as Server performance.

You might be wondering if FileMaker Pro Server can stand up to the daily rigors of your business. Rest assured. We've already put the product through our own torture chamber: the Claris® Testing Lab. We experimented with a range of Mac and Windows computer models, running them in a wide array of network and file configurations--up to 100 computers at a time. We ran tests and made refinements for a full six months. So as more and more of you become networked together, you'll find fewer clock and coffee cup icons on your screens.

So come on! Grab a FileMaker Pro Server and get the whole gang working more productively! It'll definitely be more satisfying than the company picnic. (Sorry, onion dip and chips not included.)

You can get FileMaker Pro Server now from software resellers all over the world. If you'd like the name and address of the dealer nearest you, call Claris Customer Assistance at 1-800-3CLARIS.



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The best printers include (from top to bottom) the Tektronix Phaser 300i, the Tektronix Phaser 220e, and the Hewlett-Packard DeskWriter 560C.

MW LAB

COLOR PRINTERS FOR EVERY BUDGET

Macworld Lab tests 16 ink-jet and thermal-wax printers

by Jim Heid

Still procrastinating over making the leap to color printing? You may be running out of excuses: printer manufacturers keep discovering better, faster ways to apply pigments and render images, and for less money.

The latest color machines still aren't about to replace monochrome printers—regardless of how it works, a color printer is slower, more expensive, more complex, and more finicky about paper than its monochrome equivalent. But for business presentation materials, for page proofs, and for any applications beyond gray-scale, this is a good time to follow the rainbow.

Or, more accurately, *rainbows:* each of the several color-printing technologies offers its own strengths and financial requirements. Liquid ink-jet printers span the price spectrum, ranging from $379 to over $10,000 (see "Finding the Best Business Color"). Half the printers, however, are low-end machines priced at well under $1000. These are best for simple applications such as printing color presentations and jazzing up reports with colored graphs and spot color.

Solid ink-jet machines, priced between $5595 and $9995, are popular among publishers, thanks largely to an ability to print on nearly any kind of paper. Thermal-wax printers have become the mainstays for business color printing, generally offering better output quality and faster performance than ink-jets can. Prices for thermal-wax machines have fallen into the monochrome laser territory, ranging from $995 to $8999.

For this survey, Macworld Lab tested 16 ink-jet and thermal-wax machines; last month we reviewed dye-sublimation printers, which produce photographic results but generally sell for between $8000 and $20,000 (see "Photo-realistic Color Printers," *Macworld*, July 1994).

ROBERT PERRY

The printers tested for this roundup don't do as well with scanned images; to simulate subtle color and shading shifts, they create dot patterns—this process is called *dithering*—that obscure fine details.

We also tested QMS's ColorScript Laser 1000, the first color laser for less than $10,000. (Other color lasers sell for at least twice that.) The QMS machine produces vivid and durable transparencies and handles a wide range of paper stocks, but it has some drawbacks (see "Color Lasers Move to the Desktop").

Wide Variations in Color Fidelity and Quality

When it comes to creating smooth gradations in color and to representing the colors of an original image accurately, you tend to get what you pay for with thermal-wax and ink-jet printers. Compared against the original image (top left), the print from the $5995 Tektronix Phaser 220i (top center)—one of the most highly rated units—came closest to reproducing the difficult transitions between purples, greens, and blues in the background of the original image. It also did the best job of preserving fine details. Look at the points of the green star in the top-center portion of the image and the white *S* to the lower right of the star. (Note: The banding on this image is an artifact of the process used to print this magazine.)

The Phaser 220i's corporate sibling, the $9995, solid ink-jet Phaser 300i (top right), performed relatively well but didn't quite match the crisp details of the 220i.

In contrast, the $1298 NuDesign Color Printer (bottom left) darkened the scene so much as to evoke images of Batman's Gotham City. The NuDesign unit, as well as the $629 Apple Color StyleWriter Pro (bottom center), also suffer from serious banding of colors during transitions, such as in the background.

The $4995 General Parametrics SpectraStar GTx (bottom right) was able to handle color transitions fairly well, but it suffers from an overall washed-out quality. Nor could it capture fine lines, such as those on the document near the upper left corner of the image. The GTx represents the green star as a smudge.

When looking at these images, bear in mind that in most cases, an actual printout will be slightly brighter and more vivid than can be reproduced with the technology used to produce this magazine page.



Original

NuDesign Color Printer

ILLUSTRATIONS BY STEVEN LYONS

Into the Liquid Inkwell

All color printers produce output by applying cyan, magenta, and yellow pigments. But each color-printing technology has its strengths and quirks; printers that excel on plain paper might fall flat with overhead transparency film. To pick the right printer for your jobs, it helps to understand how the technologies work.

Liquid ink-jet printers are spray painters. They use an array of microscopic nozzles that spew liquid ink onto the paper. In liquid-ink printers, the nozzles are part of a disposable cartridge that also contains a supply of ink. The print head travels left and right, making dozens of passes in the course of producing a page.

The ink itself is water based and often wicks into the paper's fibers as it dries, giving text and line art fuzzy edges. The latest ink formulations from Hewlett-Packard and Canon—the two companies that build every liquid-ink mechanism tested—dry more quickly than did earlier inks and are much less prone to wicking, especially if you print on the special, coated paper that ink-jet manufacturers sell.

Today's inks are also less likely to smear when the output gets wet. In my scientific output-durability test—wiping a wet finger across the page—the inks used in the Hewlett-Packard DeskWriter printers resisted smearing better than the inks used by the Canon, IBM, and Apple printers—all of which have Canon mechanisms.

The Battle at the Bottom

Although the past year has brought progress in every color-printing technology, the real news is at the low end. After striking out with the Apple Color Printer, Apple returned to the drawing board and came up with the $629 Color StyleWriter Pro. What an improvement.

Hardware-wise, the 11-pound Color StyleWriter Pro is an Apple-repackaged version of Canon's BJC-600, which is winning accolades in the DOS/Windows world. (The BJC-600 can be used with Macs when paired with GDT Softworks' [604/291-9121] $149 PowerPrint driver and cable package.) Like the defunct Apple Color Printer, the Color StyleWriter Pro produces 360 dpi, but the similarities end there. Apple eschewed the often-finicky SCSI bus in favor of a serial interface. That makes connecting the printer easier but could mean buying a serial switch box if your Mac's printer and modem ports are already occupied.

The Color StyleWriter Pro's fast-drying inks all but eliminate the wicking problem. Dramatically improved driver software adds a scatter-dithering option, which delivers better results with scanned

images. The new driver also provides better support for Apple's ColorSync color-management software.

The results from the improved driver made a good impression on our output-quality jury—12 *Macworld* editorial and art-department staff members. In five out of seven comparisons of unlabeled output, the majority of our jury preferred the Color StyleWriter Pro to its closest tested competitor, Hewlett-Packard's $719 DeskWriter 560C. The Color StyleWriter Pro didn't do as good a job with text (the DeskWriter 560C provides higher resolution), and its output appeared a bit more mottled than that of the DeskWriter, with less consistency in the ink coverage.

Like all of the printers tested, the Color StyleWriter Pro can be shared on a network. But unlike the other machines, Apple's ColorShare driver technology makes the host Mac (the one connected to the printer) do all the work required to process jobs. That means the host slows down as it handles jobs from other Macs on the network. The printer itself is on the slow side, too. In our tests, done with a prerelease version of the driver, the printer never did reach Apple's claim of two minutes per page. At least the output is worth waiting for.

The Color StyleWriter Pro breaks no speed records, but neither does HP's DeskWriter 560C. The latest in HP's noble line of ink-jets provides 600-by-300-dpi resolution and the Resolution Enhancement Technology previously found only in HP's laser printers. Like all of HP's Mac-compatible ink-jets, the DeskWriter 560C provides a LocalTalk port, making it better suited to network sharing than Apple's Color StyleWriter Pro.

While the Canon-based machines tested provide four ink cartridges (cyan, magenta, yellow, and black), the DeskWriter 560C provides two: a black cartridge and a tricolor cartridge containing cyan, magenta, and yellow inks. This makes replacing ink a bit easier (the Canon cartridges can leak if you aren't careful), but because each of the tricolor cartridge's ink chambers are so small, you're likely to have to replace the $34.95 cartridge more often—even if only one chamber runs dry.

Moving Up: PostScript Ink-Jet

QuickDraw printers such as the Color StyleWriter Pro and the DeskWriter 560C give mediocre results when used with PostScript-oriented programs such as Adobe Illustrator and Aldus FreeHand. In the past, the answer has been PostScript-clone interpreters that run on the Mac, such as TeleTypesetting Company's T-Script ($85 to $495, 617/734-9700). DeskWriter 560C and Color StyleWriter Pro users have another choice: true Adobe PostScript Level 2 interpreters that run on the Mac. HP offers a $249 PostScript Level 2 software driver kit for the DeskWriter 560C.

GDT Softworks offers similar software, the $149 StyleScript, for the Apple Color StyleWriter Pro. StyleScript is based on Adobe's Configurable PostScript Interpreter (CPSI), which up to now has been used only on high-end



Tektronix Phaser 220i



Tektronix Phaser 300i



Apple Color StyleWriter Pro



General Parametrics SpectraStar GTx

printers such as 3M's $20,000 Rainbow dye-sublimation unit. CPSI has stiff memory requirements, though—8MB minimum and up to 12MB for large PostScript images, according to GDT Softworks. Even on a fast Mac, you won't get sizzling performance, and your Mac will slow as it processes print jobs.

Hardware-based PostScript printers deliver better performance, yet there are only three choices in the liquid ink-jet world. We tested two of them: Lexmark's $3199 IBM Color Jetprinter PS4079 and Canon's CJ-10 with PostScript interface option. (The third machine is HP's $2749 DeskJet 1200C/PS.)

Lexmark's IBM Color Jetprinter PS4079 combines the 360-dpi engine built by Canon for the BJC-820 with a built-in PostScript-clone interpreter. The Color Jetprinter PS4079 is more tortoise than hare—it was the slowest printer tested when used in its best-quality mode, wherein the print head pauses for eight seconds after each pass to allow the ink to dry and prevent one pass from bleeding into the next. In its faster mode, the printer cut 30 percent or more time in four of five tests, not to damn it with faint praise.

To its credit, though, the Color Jetprinter PS4079 provides a built-in LocalTalk port and is compatible with DOS/Windows machines—Apple's Color StyleWriter Pro and HP's DeskWriter 560C can't make that latter claim. The Color Jetprinter PS4079 is also the only liquid ink-jet tested that provides an emulation mode for the Hewlett-Packard Graphics Language (HPGL), which ensures the printer's compatibility with drafting and computer-aided design packages. Its ability to handle 11-by-17-inch paper also makes it a good choice for drafting applications.

The Color Jetprinter PS4079 provides enhanced halftoning options, called ColorGrade, that deliver good results with scanned images. Indeed, our output jury generally preferred the Color Jetprinter PS4079's output to that of the other PostScript liquid-ink machine: Canon's CJ-10, which retails for $10,990.

Ten grand for a liquid-ink printer? Yes, but the CJ-10 is actually a desktop copier that marries a Canon color-copier to a 400-dpi ink-jet print mechanism. It's a good enough copier to prompt a warning in the manual against copying currency and stamps. Front-panel buttons let you adjust brightness, contrast, and color balance as well as reduce and enlarge. The copier also accepts an optional ($1250) slide-scanning attachment and a video adapter ($1800) that lets you print images from a camcorder or other video source.

The $10,990 version of the CJ-10 includes Canon's CJ PS-IPU PostScript interface. The PS-IPU sits beneath the copier and turns it into a PostScript print-

MW LAB How Fast for Business Color?

Best result in each test. Printers are listed by category in decreasing order of overall speed. Times are in seconds. Smaller bars are better.

Printer Name	PostScript Graphic Print speed for a FreeHand illustration that includes special PostScript effects, such as nonlinear blends and Bézier curves.	Object-Oriented Graphic Print speed for a complex MacDraw Pro document containing more than 840 color objects, most of them gradient-filled.	Photoshop RGB Using Plug-in Print speed for a 7MB, 200-dpi, RGB Photoshop file using the printer's driver.	Page-Layout Document Print speed for a 4-page PageMaker newsletter with several fonts, a PostScript graphic, a PICT file, and color TIFF file.	Presentation-Graphic Transparency Print speed for a PowerPoint transparency with gradient background and color TrueType text.
Thermal-Wax/Laser					
Tektronix Phaser 220i	87	351	618	171	55
Tektronix Phaser 220e	118	566	639	224	61
DEC DECcolorwriter 1000	116	489	702	229	66
CalComp ColorMaster Plus 6603XF[1]	144	378	586	301	91
General Parametrics SpectraStar GTx[1]	104	348	1695	308	80
QMS ColorScript Laser 1000	116	446	3121	230	107
Tektronix Phaser 220e[2]	292	644	682	322	97
NuDesign Color Printer[3]	366	411	405	1138	278
QMS ColorScript 230	179	469	4639	384	122
Tektronix Phaser 220i[2]	416	986	792	463	111
DEC DECcolorwriter 1000[2]	417	992	778	433	119
Solid Ink-Jet					
Tektronix Phaser 300i	142	396	737	406	92
Tektronix Phaser 300i[2]	339	597	893	963	234
Dataproducts Jolt PSe	358	864	2290	1046	331
Dataproducts Jolt PSe[2]	430	934	2212	1185	586
Liquid Ink-Jet					
Canon CJ-10 with PS-IPU[4]	191	530	1607	530	158
Apple Color StyleWriter Pro[3]	402	667	227	523	301
Canon CJ-10 with IPU SS[2,5]	558	1039	118	1739	232
Hewlett-Packard DeskWriter 560C	425	441	540	811	1128
Apple Color StyleWriter Pro[2,3]	499	736	328	1014	436
Lexmark IBM Color Jetprinter	459	1068	800	765	602
Canon BJC-820[5]	618	1109	385	1906	371
Hewlett-Packard DeskWriter 560C[2]	763	547	882	1419	1075
Lexmark IBM Color Jetprinter[2]	1197	1514	1503	3525	592

[1] Default resolution is same as enhanced mode. [2] Tested at high resolution. [3] Tested using serial-to-parallel converter. [4] High resolution is default. [5] Tested using SCSI port.

BEHIND OUR TESTS

Macworld Lab gauged printer speed with a variety of documents and techniques, each designed to test performance from a different perspective. Except where noted differently, we tested the printers at default resolution, using the LocalTalk port.

The PostScript Graphic test shows the performance of a PostScript printer's controller. The Object-Oriented Graphic document also tests controller processing performance. The Photoshop test measures the printer's ability to handle large bitmapped images as well as network interface performance. The Page-Layout test gives the printers a good overall workout and demonstrates how well each machine handles typical publishing jobs. The Presentation-Graphic Transparency test looks at a primary business use for this class of color printer.

To judge output quality, 12 staffers from *Macworld*'s editorial and art departments compared four different unidentified printouts against photographic prints of the original images, looking at highlights, shadows, color accuracy, and text.

—Macworld Lab testing supervised by Mark Hurlow

QMS's $9999 ColorScript Laser 1000 is the first desktop-laser color printer—but your desktop had better be capable of supporting a hefty 106 pounds. The printer uses four toner cartridges; setup and maintenance are more cumbersome than with other color technologies, with numerous hoppers, belts, and drums to replace at varying intervals (see *Reviews, Macworld,* July 1994).

One big advantage the ColorScript Laser 1000 has over competing technologies is its low operating cost. You can use cheap photocopier bond instead of the ultrasmooth laser bond or special, coated stocks that thermal-wax machines require. Also, the amount of toner applied varies depending on what's on each page; by comparison, a thermal-wax printer always uses an entire set of four ink sheets for each page, wasting pigment for pages containing mostly white space. These factors combine to deliver output that costs only 5 to 10 cents per color page, versus about 60 cents for thermal-wax.



QMS ColorScript Laser 1000 Vivid output, though blotchy in spots.

Where output quality is concerned, there's good and bad news. The good news is that business documents look great—colored bar charts and spot-color headlines stand out beautifully against sharp black text. (Our output jury gave high marks to the machine's text quality.) The output is also more durable than thermal-wax or solid-ink output, with no flaking or scratching.

But the printer's colors aren't as vivid as those produced by competing technologies, nor do scanned images look as good. (The printer ranked near the bottom in most image-quality tests.) The printer's speed in most tests was good, although it finished second-to-last among all printers tested in our Photoshop test.

But the ColorScript Laser 1000 isn't designed for prepress or digital-imaging applications. It's intended to provide color capabilities to a workgroup that would otherwise use a monochrome laser printer, and it meets this goal. The ColorScript Laser 1000 is suitable for business color applications and for printing short runs of color documents such as presentations. You decide whether these strengths outweigh relatively slow performance, and high maintenance requirements and price.

At press time, QMS announced another color laser printer: the QMS magicolor Laser Printer, which is the world's first 600-dpi color laser printer. The magicolor uses an engine similar to that of the ColorScript Laser 1000 (indeed, an upgrade is available for $2499, including installation). Unlike many thermal-wax machines, the magicolor provides 600-dpi resolution in both the horizontal and vertical dimensions. The sample output I examined boasted smooth-edged text and halftones whose quality matched that of the best solid-ink and thermal-wax machines.

By the time you read this, the magicolor Laser Printer should be available in two configurations: a $9999 model that prints in monochrome at 600-dpi and in color at 300-dpi; and a $10,999 model that supports 600-dpi color. (The only other difference between the two is memory: the low-end version provides 12MB, while the all-color model contains 28MB.)

Xerox (800/275-9376, ext. 4900) will also offer a desktop color laser unit, the 4900 Color Laser Printer, which should be announced by the time you read this. The printer will sell for under $10,000 and boasts a resolution of 1200 by 300 dpi. The unit is aimed at the same market as the QMS units—business color for presentations, marketing materials, and internal reports.

er. A unique operating mode lets you combine a photocopy with a computer document—to superimpose text over a photograph, for example.

A less-expensive ($8690) version of the CJ-10 is available that uses a QuickDraw-based interface, which connects to the Mac's SCSI port. The PostScript interface was faster in all tests except for the Photoshop test, in which it took almost 14 times as long. Why the huge disparity? The PostScript interface uses the laggardly LocalTalk port, which transfers data far more slowly than does SCSI. But the PostScript interface provides better network sharing and generally better output quality.

The Solid-Ink Alternative

Imagine candle wax dripping and solidifying on a paper tablecloth, and you have the idea behind the other major ink-jet technology: solid ink. Four printers—the Phaser 300i and Phaser IIIPXi from Tektronix, Dataproducts Corporation's Jolt PSe, and the Brother HS-1PS2—use wax-based ink sticks that are melted in the printer's engine. The ink is sprayed onto the page, where it solidifies almost immediately. Like the wax on the paper tablecloth, nearly all of the ink sits on the paper instead of soaking into it.

The solid-ink approach eliminates the wicking problem and works well on plain photocopier bond, card stock, letterhead—anything a laser printer can handle. This versatility has made solid-ink printers—particularly Tektronix's Phaser IIIPXi and Phaser 300i—popular among designers creating packaging comps.

Tektronix has polished solid-ink technology until it glitters. The latest member of its solid-ink line, the $9995 Phaser 300i, is faster and produces better output than the Phaser IIIPXi, which is still available at a reduced price of $6995. The machines are otherwise similar: both are big boxes that accept paper as small as 4 by 6 inches and as large as 12 by 18 inches.

In its premium-quality printing mode, the Phaser 300i earned some of the highest marks from our output-quality jury. In this mode, however, the printer was substantially slower than the fastest thermal-wax machines. In its standard-quality mode, the Phaser 300i did a better job of keeping up with the thermal-wax crowd, but at the expense of output quality. (This tug-of-war between output quality and performance occurred with most of the printers tested.)

Dataproducts' Jolt PSe has been improved somewhat over the Jolt PS we tested last year (see "Ink-Jet," *Macworld,* May 1993). The printer's output is still on the fragile side—fold a page in half, and the ink flakes off along the fold. The printer also requires more maintenance; you have to feed in a special head-cleaning sheet after each power-up. The Jolt PSe was also among the slowest machines tested, and our jury rated its output quality as inferior to that of the Phaser 300i.

Solid-ink technology has some drawbacks that transcend individual models.

Finding the Best Business Color

Company	Phone	Product	Imaging Technology	Tested by Macworld Lab	List Price	Standard Ports/ Optional Ports/ All Active
Apple Computer	408/996-1010, 800/767-2775	Color StyleWriter Pro	liquid ink-jet	●	$629	S/none/NA
Brother	908/356-8880, ext. 4300	Brother HS-1PS2	solid ink-jet	○	$8995	L, P, S/none/●
CalComp Systems	800/225-2667	Colormaster Plus 6603XF	thermal wax	●	$5495	L, P, S/E/●
Canon USA	800/848-4123	BJC-820	liquid ink-jet	●	$2199	P, SCSI/none/○
		CJ-10 (PostScript)	liquid ink-jet	●	$10,990	L, P, S/none/●
		CJ-10 (QuickDraw)	liquid ink-jet	●	$8690	SCSI/none/NA
Dataproducts Corporation	800/980-0374	Jolt PSe	solid ink-jet	●	$5595	L, P, S/E/●
Digital Equipment Corporation	508/493-5111	DECcolorwriter 1000	thermal wax	●	$3999	L, P, S/E/●
Fargo	612/941-9470, 800/327-4622	Primera Color Printer	thermal wax	○	$995	P, S/none/○
General Parametrics	510/524-3950	SpectraStar GTx	thermal wax	●	$4995	L, P, S/none/●
		SpectraStar GLx	thermal wax	○	$3795	L, P, S/none/●
Hewlett-Packard	800/752-0900	DeskWriter C	liquid ink-jet	○	$485	L, S/none/●
		DeskWriter 310	liquid ink-jet	○	$379	L, S/none/●
		DeskWriter 550C	liquid ink-jet	○	$599	L, S/none/●
		DeskWriter 560C	liquid ink-jet	●	$719	L, S/none/●
		DeskJet 1200C/PS	liquid ink-jet	○	$2749	L, P/E, T/●
Lexmark	606/232-2000, 800/358-5835	IBM Color Jetprinter PS4079	liquid ink-jet	●	$3199	L, P, S/none/●
NuDesign Engineering	612/832-5622, 800/762-3531	NuDesign Color Printer	thermal wax[3]	●	$1298	P, S/none/○
QMS	205/633-4300, 800/523-2696	ColorScript 210	thermal wax	○	$4595	L, P, S/E, T/●
		ColorScript 230	thermal wax	●	$7335	L, P, S/E, T/●
		ColorScript Laser 1000	laser	●	$9999	L, P, S/E, T/●
Seiko Instruments	408/922-5800, 800/873-4561	Personal ColorPoint PSE	thermal wax	○	$2999	L, P, S/none/●
		ColorPoint PSN Model 4	thermal wax	○	$5999	L, P, S/E/●
		ColorPoint PSN Model 14	thermal wax	○	$8999	L, P, S/E/●
Tektronix	800/547-8949	Phaser 200e	thermal wax	○	$2995	L, P, S/none/●
		Phaser 220e	thermal wax	●	$3995	L, P, S/TC/●
		Phaser 220i	thermal wax	●	$5995	L, P, S/E, TC/●
		Phaser IIIPXi	solid ink-jet	○	$6995	L, P, S/E, TC/●
		Phaser 300i	solid ink-jet	●	$9995	L, P, S/E, TC/●

● = yes; ○ = no. Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests. E = Ethernet, L = LocalTalk, NA = not applicable, P = parallel, S = serial, SCSI = small computer system interface, T = Token Ring, TC = TCP/IP. [1]PostScript Level 2 optional. [2]600 by 300, black. [3]Also provides dye-sublimation imaging.

The printers have warm-up times that rival that of a starting pitcher, taking about 20 minutes before their ink sticks are melted.

A more serious drawback is that solid-ink machines produce transparencies that look washed out when projected. That's because the solid beads of ink tend to refract light from the projector. Both Dataproducts and Tektronix sell desktop laminators that apply a second layer of film to counteract this phenomenon, but this adds cost and an extra step to the printing process. The best technology for transparencies remains thermal wax.

Iron-on Color

Thermal-wax printers' color comes from a roll of plastic film coated with pigmented wax in each of the three process colors (and optionally, black). The plastic is sandwiched between the paper and a print head containing thousands of evenly spaced heating elements. Where an element is hot, it melts a dot of wax, which transfers to the page. After one color's dots are applied, the ink roll advances to the next color.

In the last few years, as dye-sub printers have become cheaper, ink-jet printers have become better, and color lasers have knocked on the door, some people have predicted the demise of thermal-wax technology. But death reports would be premature. Thermal-wax manufacturers have added plain-paper capabilities, and thermal-wax machines were the fastest color printers Macworld Lab tested. Thermal-wax printers also provide unique output options, including media for making iron-on fabric transfers and static-cling signs. (Seiko's machines support the largest selection of offbeat output options.)

Best of all, thermal-wax prices have fallen substantially; Seiko Instruments' Personal ColorPoint PSE, an Editors' Choice in last year's roundup, retails for just $2999, while Tektronix's Phaser 200e lists for $2995 (down from $3695 last year). Fargo's Primera sets a new low at $995, but it's slower than these machines and its 203-dpi output isn't in the same league. The Primera is also sold by NuDesign Engineering as the NuDesign Color Printer for $1298.

Fargo and Seiko have taken a different approach to fending off competing technologies. Both firms offer thermal-wax machines that also operate as dye-sublimation printers (see "Photo-realistic Color Printers," *Macworld*, July 1994). We hoped to test the Seiko Professional ColorPoint PSF Model 14 for this story, but the unit's ship date slipped yet again—proof, perhaps, that creating a machine that straddles both camps isn't easy. I spent some time with a prototype and was impressed with its features and output quality; Seiko says the machine will be available by the time you read this.

Many of the latest printers from Tektronix, Digital Equipment Corporation (DEC), and General Parametrics have borrowed a page from the monochrome laser book, offering resolution higher than the standard 300 dpi. Tektronix's Phaser 220e and Phaser 220i, DEC's DECcolorwriter 1000, and General Parametrics' SpectraStar GTx and SpectraStar GLx provide 600-by-300-dpi output, obtaining the higher resolution on the long axis of the page by advancing the paper in smaller steps. The benefits are the same as with any type of noncontinu-

RAM (base model/ maximum)	Resolution (in dots per inch)	Imaging Language	SCSI Port for Font Storage	Number of Fonts	Prints on Plain Paper/Provides Manual-Feed Slot	Paper Sizes	Technical Support
NA	360	QuickDraw	○	64	●/○	A, A4, lgl	not rated
12MB/44MB	300	BR-Script Level 2	●	35	●/●	A, A3, A4, B, B4, B5, lgl, SB	not rated
8MB/64MB	300	PhoenixPage Level 2	●	35	●/○	A, A0, A3, A4, A40, B, B0	not rated
NA	360	QuickDraw	○	0	●/○	A, A4, lgl, B, B4	very good
16MB/16MB	400	PostScript Level 2	●	39	●/●	A,A4	
16MB/16MB	400	QuickDraw	NA	0	●/●	A,A4	
8MB/12MB	300	PostScript Level 2	●	39	●/●	A, A4, B5, folio, executive, lgl	very good
8MB/8MB	600 × 300	PostScript Level 2	○	17 (39 optional)	●/●	A	not rated
NA	203	QuickDraw	○	0	○/○	A, A4	not rated
10MB/32MB	600 × 300	PowerPage Level 2	●	52	●/○	A, A4	very good
8MB/24MB	600 × 300	PowerPage Level 2	○	52	●/○	A, A4	
64K/64K	300	QuickDraw	○	35	●/○	A, A4, executive, lgl	very good
128K/128K	300	QuickDraw	○	35	●/●	A, A4, executive, lgl	
128K/128K	300	QuickDraw	○	35	●/○	A, A4, executive, lgl	
48K/256K	600 × 300	QuickDraw[1]	○	35	●/○	A, A4, executive, lgl	
4MB/20MB	300, color[2]	PostScript Level 2	○	35	●/○	A, A4, lgl	
4MB/16MB	360	PhoenixPage Level 2	○	35	●/○	A, A3, A4, B, B5	acceptable
32K/32K	203	QuickDraw	○	0	○/●	A, A4, long A4	poor
8MB/32MB	300	QMS Level 2	optional	65	●/●	A, A4, lgl	very good
13MB/32MB	300	QMS Level 2	optional	65	●/●	A, A4, B, lgl, SB	
12MB/32MB	300	QMS Level 2	●	65	○/●	A, A4, lgl	
6MB/22MB	300	PhoenixPage Level 1	○	39	●/○	A, A4, B4, lgl	not rated
4MB/40MB	300	PhoenixPage Level 2	○	39	●/○	A, A4, SA	
12MB/40MB	300	PhoenixPage Level 2	○	39	●/○	A, A3, A4, B, B4, SB	
4MB/8MB	300	PostScript Level 2	○	17	●/○	A, A4	very good
8MB/8MB	600 × 300	PostScript Level 2	○	17 (39 optional)	●/○	A, A4	
10MB/14MB	600 × 300	PostScript Level 2	●	39	●/○	A, A4	
10MB/22MB	300	PostScript Level 2	●	39	●/●	4 × 6 inches to 12 × 18 inches	
10MB/22MB	300	PostScript Level 2	●	39	●/●	4 × 6 inches to 12 × 18 inches	

ous-tone printer: sharper text output and finer image halftones.

All five of these machines use a fast, Sharp-built print engine that can print on plain paper when used with a special ink roll. The ink roll sacrifices the black-ink panel in favor of a primer medium that is applied to areas of the page that will contain ink. The medium smooths the rough surface of plain paper, making it more receptive to the pigmented wax. It's a slick trick, but it's effective only when used with ultrasmooth plain paper such as Hammermill Laserprint or Nekoosa Laser 1000. These printers also have excellent paper-handling features.

On the test track, the Phaser 220i beat its look-alikes and was, in fact, the fastest printer tested—in 300-dpi mode, that is. In 600-by-300-dpi mode, the printer finished second to the Phaser 220e.

The Phaser 220e's output also impressed our jury, which gave it the highest rating. Among thermal-wax machines, the jury was least impressed with the output from the General Parametrics SpectraStar GLx, QMS's ColorScript 230, and CalComp's Colormaster Plus 6603XF. (That last machine has a unique attribute, though: it's the only thermal-wax machine tested that can print on both sides of a sheet of paper.)

Picking the Winners

Among low-end ink-jets, the Apple Color StyleWriter Pro delivers superior image quality (though inferior text quality) and is more compact. The HP DeskWriter 560C's superior text quality and networking features give it an edge over the Apple unit but by a small margin. If you can live with the Color StyleWriter Pro's approach to networking, and image quality is most important to you, pick the Apple unit.

In the solid-ink world, Tektronix's Phaser 300i wins hands down. The Dataproducts Jolt PSe costs far less, but it can't print tabloid-size pages and its output is on the fragile side. If you need color business documents, consider a plain-paper-capable thermal-wax machine instead.

Tektronix gets the gold in the thermal-wax category, too. Its Phaser 220i is fast, and its 600-by-300-dpi resolution yields the best thermal-wax output quality I've seen. If your budget barks at the $5995 price, consider the $3995 Phaser 220e, which delivers similar quality. **m**

Contributing editor JIM HEID has reviewed hundreds of monochrome and color printers, starting with Hewlett-Packard's ThinkJet in 1984. He is also the author and producer of *Macworld Complete Mac Handbook Plus CD*, third edition (IDG Books Worldwide, 1994).

BUSINESS COLOR PRINTERS

MW EDITORS' CHOICE

In a complex, broad category of color printers for typical business tasks, we selected winners in three categories.

Low-End Ink-Jet

DeskWriter 560C This printer offers excellent text quality, thanks to its 600-by-300-dpi resolution and HP's Resolution Enhancement Technology. **Company:** Hewlett-Packard. **List price:** $719.

Solid Ink-Jet

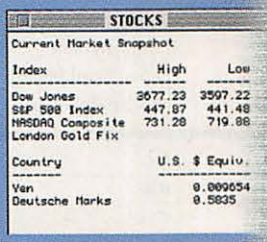
Phaser 300i Tektronix made a good thing better when it improved the output quality and performance of its venerable Phaser IIIPXi, which remains available at a reduced price. **Company:** Tektronix. **List price:** $9995.

Thermal-Wax Transfer and Color Laser

Phaser 220i This printer combines plain-paper capabilities, 600-by-300-dpi resolution, and fast performance. **Company:** Tektronix. **List price:** $5995.



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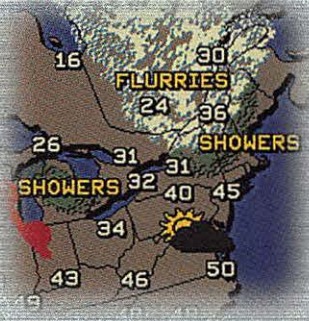
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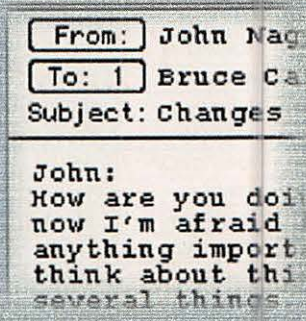
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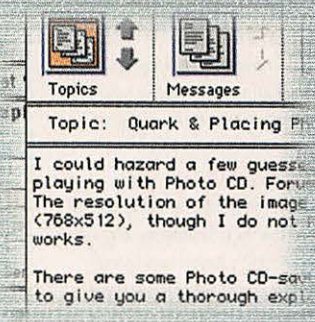
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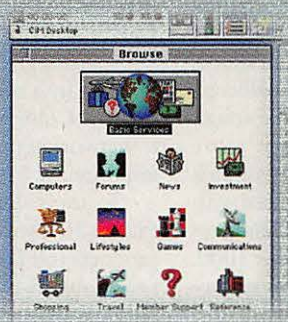
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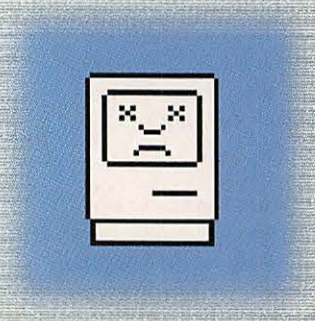
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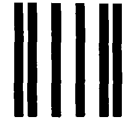
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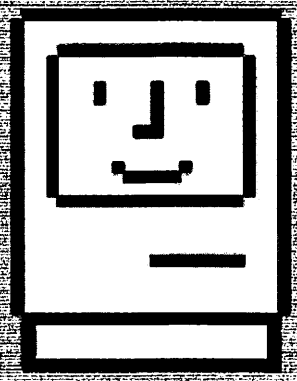
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EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Two Ways to Make a Big Impression

NEED POSTER-SIZE, FULL-COLOR OUTput? If so, you've got two new options: a Hewlett-Packard ink-jet printer designed for producing in-house, large-format images, and a Raster Graphics electrostatic printer for short-run color jobs from your service bureau.

The HP DesignJet 650/PS, expected to be available in June, is a PostScript Level 2 ink-jet device capable of printing five-color (CMYK, plus a spot color) images up to 3 feet wide and 9 feet long. The DesignJet is aimed at graphic designers who need to quickly produce inexpensive, large-format comps and posters.

The 300-dpi printer comes in two models: D-size (24 inches wide), for $9995; and E-size (36 inches wide), for $11,595. The printer uses special ink-jet cartridges and paper; a 3-by-4-foot print would cost an average of $3 to $5 in consumables, compared with the $50 or more you'd pay a service bureau to output your file.

HP says the DesignJet is ideal for large, short-term color images, such as posters displayed at trade shows. Images printed on the DesignJet's paper stock and inks are designed to last up to a year under low-lighting conditions.

The DesignJet uses an Intel i960CA RISC chip and offers three printing modes: Draft, Final, and Enhanced. In Enhanced mode, HP's new scatter-halftoning rendering helps eliminate banding. The printer comes standard with LocalTalk, EtherTalk, Novell Ethernet, TCP/IP, Centronics parallel and RS-232C serial connectivity, 4MB of memory (upgradable to 68MB using proprietary HP memory), 39 Adobe Type 1 PostScript fonts, and Pantone color reference tables. The DesignJet isn't exactly a desktop printer, though—the 24-inch output model, for instance, weighs 128 pounds and is 43 by 28 by 45 inches.

Meanwhile, Raster Graphics' Digital ColorStation 5400 is able to produce four-color prints up to 52 inches in width and of virtually unlimited length. The ColorStation 5400 is designed for short-run, on-demand color print jobs (on coated stock) of 1 to 200 copies.

continues on page 119



DOUGLAS FRASER

Pedal-to-the-Metal Slide Scanner

POLAROID CORPORATION'S ELECtronic Imaging Systems group has introduced the SprintScan 35, a $2495 color 35mm slide and film scanner that reportedly digitizes images at top resolution (2700 dpi) up to ten times faster than competitive slide scanners.

The SprintScan 35 uses Polaroid's proprietary implementation of Time Delayed Integration, a method by which the scanner's trilinear CCD array passes more quickly over an image yet yields better scanning results. In addition, the device includes such hardware-based features as sharpening, color correction, and image scaling for fast image processing. The SprintScan captures images in a single pass in 30-bit color and automatically samples them to 24-bit.

The SCSI-2–device SprintScan will ship in late July with an Adobe Photoshop plug-in filter for scanning directly into the image-editing application; a Windows version will ship in June. Polaroid, 800/662-8337.—J.A.M.

"TWO WAYS" continued from page 118

The ColorStation 5400, to be available in June, costs $99,500 and up, and is aimed mostly at reprographic shops, imaging service bureaus, and photo labs. Service bureau customers can expect to pay $50 to $80 for a 3-foot-by-4-foot image. The 5400 is a direct-to-print device, meaning CMYK output can be printed directly from a Mac application. The 200-dpi device uses a web-cylinder transport system, which the company says helps produce clean, clear print quality.

Hewlett-Packard, 208/323-2551, 800/354-7622; Raster Graphics, 408/738-7800, 800/441-4788.—J.A.M.

ReadySetGo Prepares for GX

MANHATTAN GRAPHICS Corporation is going against the grain and developing a version of ReadySetGo for the PowerPC and 680X0 architectures that's largely dependent on QuickDraw GX.

The company says that the GX edition of the page-layout program will give users a single imaging and printing architecture—QuickDraw GX—as opposed to relying on QuickDraw for screen rendering and PostScript for output.

To date, however, ReadySetGo's support for GX is unusual among page-layout programs. There are currently no plans to add GX capabilities to QuarkXPress, according to a Quark spokesman. Aldus declined to talk about specific plans for GX support in PageMaker.

ReadySetGo GX version 6.5 (the program's likely name) will offer GX features such as automatic ligatures, optical font alignment, text on a curve, and page-by-page formatting. The program will also let users draw and edit quadratic Bézier curves; one version of the program will support Arabic and Hebrew text, and another version that supports kanji will be available in early 1995. Because it relies on GX for many capabilities, the program will require minimal RAM and hard drive space and will run faster than previous ReadySetGo versions, the company says.

ReadySetGo 6.0, the current version, will continue to be available for users without QuickDraw GX. The GX version will ship later this year. Suggested retail price is $395; upgrades from ReadySetGo versions 5.0 and 6.0 should be about $70. Manhattan Graphics, 914/725-2048, 800/572-6533.—J.A.M.



KEVIN CANDLAND

The HP DesignJet 650/PS

New Digital Faces

THE FONT BUREAU, A BOSTON-BASED type foundry, has announced three digital PostScript Type 1 typefaces: Village, a text face originated by Frederic Goudy in 1932; Tasse, designed for display use; and Giza, for text and display. A spokesman said The Font Bureau will offer TrueType GX versions of these faces if there's a demand. The typefaces are sold by FontHaus (800/942-9110) and FontShop (800/363-6687).—J.A.M.

MAC Typeface 12345678
MAC Typeface 123
MAC Typeface 123

Three new Font Bureau offerings, in 18-point type. Top: Tasse (regular wide). Middle: Village (regular roman). Bottom: Giza (style One Three).

Adobe Revamps Licensing, Updates ATM

ADOBE SYSTEMS HAS BEGUN licensing its fonts for use on up to five computers for each individual typeface package purchased. In the past, Adobe's font licenses were for a single printer. But the company says that a growing number of users prefer per-computer licensing agreements, which make it easier to ensure that the users have the appropriate number of licensed copies of a particular typeface.

The new licensing policy doesn't allow you to give a copy of a font to your service bureau. Adobe has unveiled a new pricing policy specifically for service bureaus, however. The policy enables any service company whose primary business is graphical output to pay as little as $10 per typeface (a savings of $15 or more) using Adobe's Type On Call CD-ROM font-unlocking system.

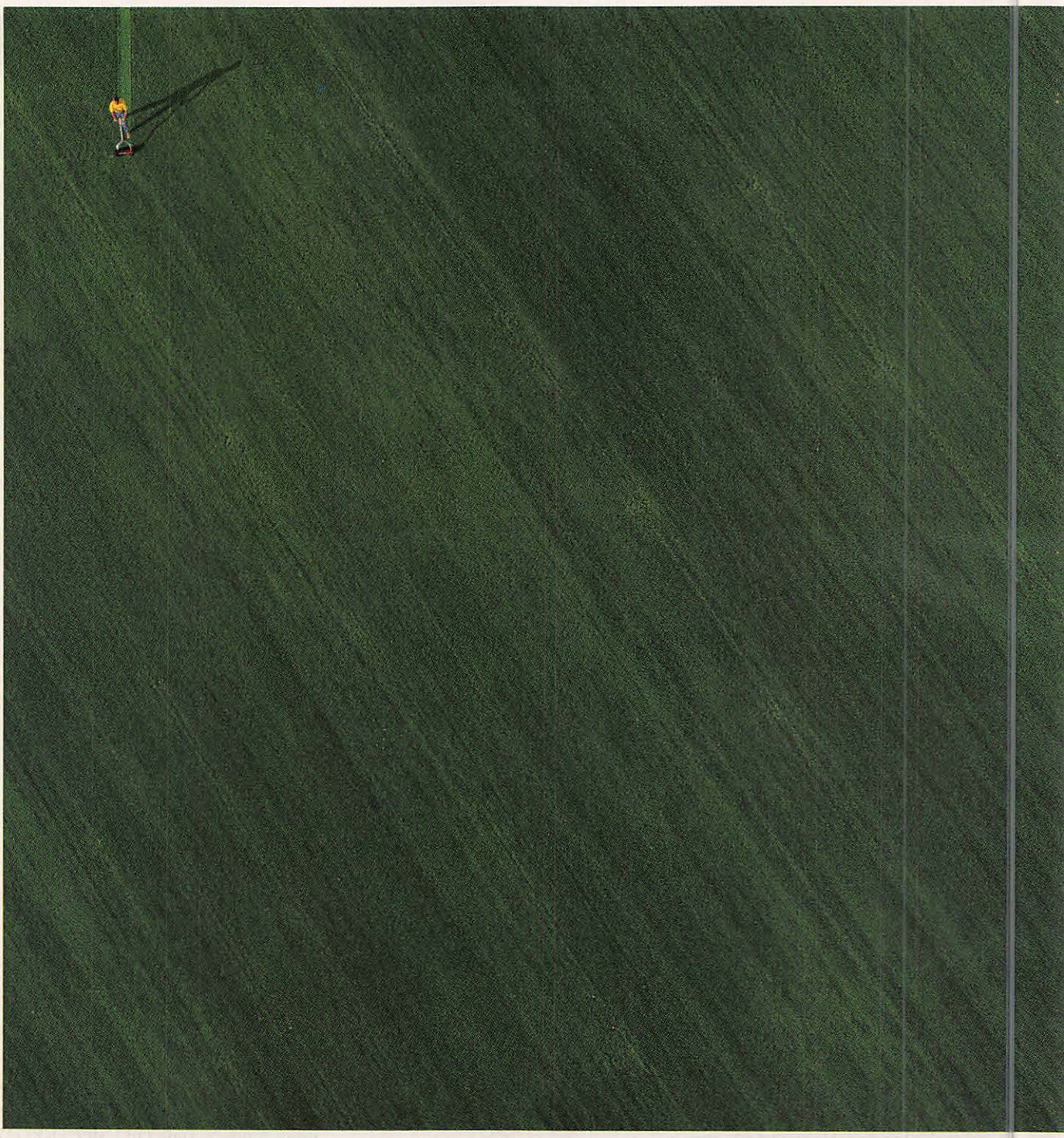
Adobe also announced that the native-mode PowerPC version of Adobe Type Manager is scheduled to ship in July. ATM version 3.8 will automatically install either the PowerPC or 680X0 version of the utility, depending on your Mac's CPU. ATM 3.8 will also include font substitution, as previously available in SuperATM. Separately, Adobe announced that ATM is now included, without charge, in every font package it sells. Adobe Systems, 415/961-4400, 800/833-6687.—J.A.M.

IN BRIEF

■ **Adobe Tunes In to FM** Adobe Systems plans to license its Frequency Modulation (FM) screening technology, Brilliant Screens, to manufacturers of imagesetters, printers, and presses. Brilliant Screens promises to offer enhanced image detail and significantly reduce moirés. Device manufacturers will make it available to end users. 415/961-4400, 800/833-6687.

■ **Power Mac Update** Canto Software has released native PowerPC versions of its Cumulus image database and Cirrus scanning/image-editing applications. Both programs are available in full-featured and limited-capability versions. Prices vary based on program version and number of users. 415/431-6871, 800/332-2686.

■ **Computer Art Contest** The Art Institute of California is sponsoring the National Computer Art Awards, supposedly the first-ever competition of its kind for American computer artists. The deadline for submissions is August 1, 1994. For more information, send a self-addressed, stamped envelope to the National Computer Art Awards, 1125 Jefferson St., Napa, California, 94559; or call 707/226-1776.



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Raven Array



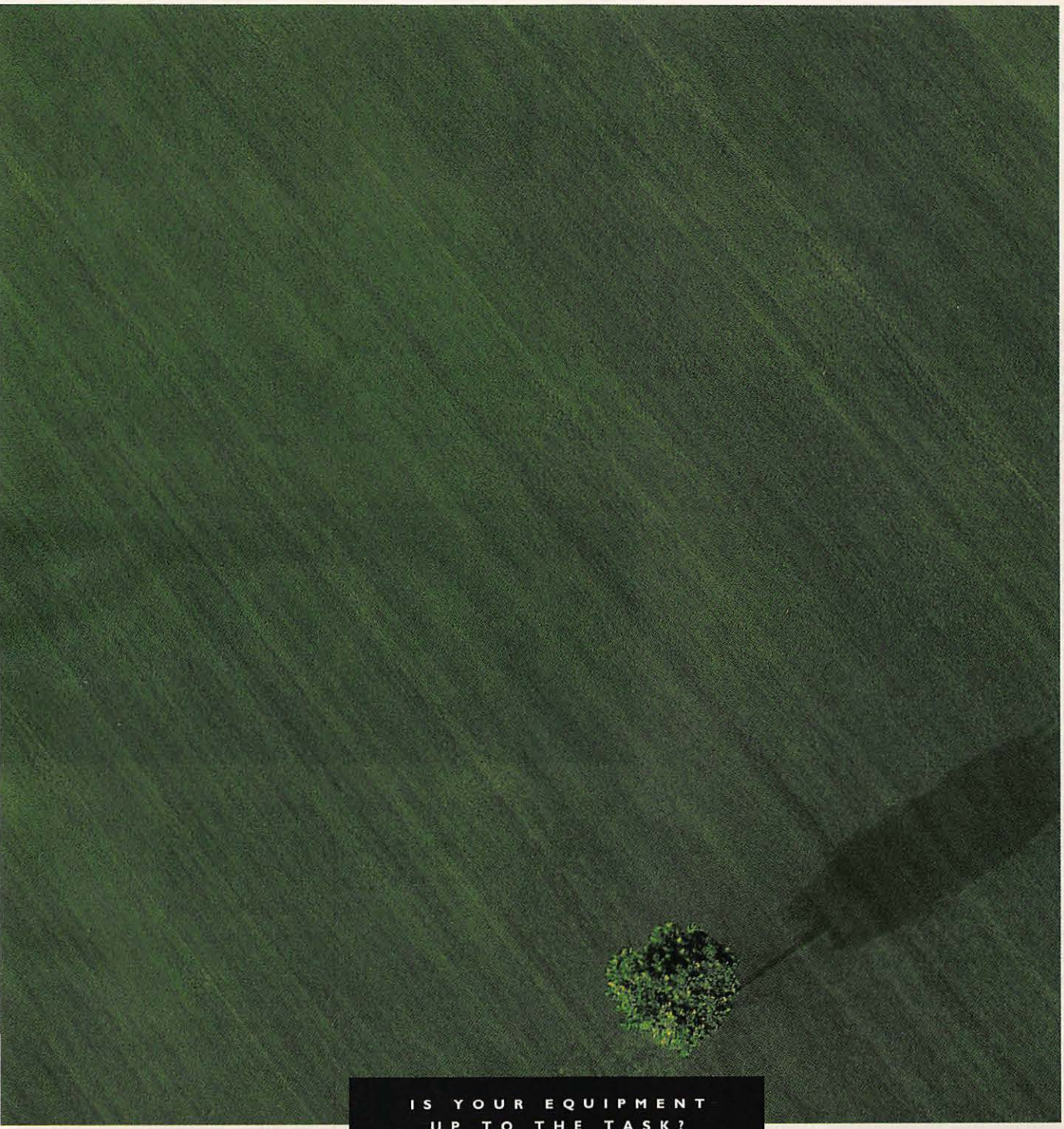
Optical Drive



SyQuest Drive



DAT Backup



between conception and completion. So in a world where time is measured in milliseconds and capacity in gigabytes, MicroNet provides productive solutions that can change the way you work. To impact your company's throughput, call your local reseller or 1-800-800-DISK.

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Circle 139 on reader service card

Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Daniel Pelavin is an illustrator and typographic designer based in New York City who began working regularly on the Mac two years ago. Pelavin's typeface ITC Anna was recently added to the Adobe Type Library.

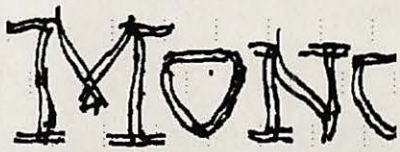
How It Was Done: Pelavin began designing the typeface he calls Monograph by sketching the letters on paper. In Illustrator, Pelavin created the skeleton of each character out of simple strokes. Monograph has a fairly uniform stroke weight; its uppercase and lowercase letters differ in weight only slightly to maintain a consistent appearance.

To create Monograph's bold characters, Pelavin doubled the size of the original letters and scaled up their line weight, then reduced them back down to normal size without scaling down the weight. Then he manually fine-tuned some of the letters, such as shortening the loop in the uppercase *C* and shortening the serifs on the uppercase *F* and *T*.

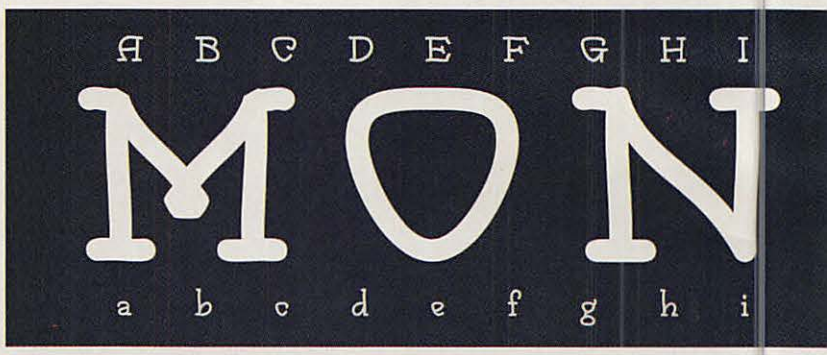
Although many fonts include stock character sets for unusual characters such as ligatures and symbols, Pelavin elected not to follow this route. Instead he designed each of Monograph's special characters from scratch.

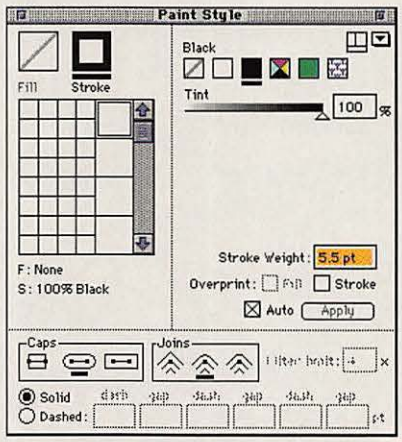
After designing the complete 223-character set—including foreign-accented letters, symbols, and punctuation—Pelavin's next step was to convert the strokes to outlines so the characters would be ready for importing into the font-creation program Fontographer. While it includes many of the tools found in Illustrator, Fontographer also contains features specifically for controlling a typeface's width and spacing, or kerning.

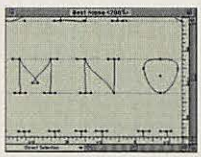
Finally, after Pelavin had finished testing and adjusting the letters for proper spacing and optimum readability, he was ready to generate the final Type 1 PostScript font in Fontographer's Generate Font Files window. This produced an outline font that would output at the best available resolution on any PostScript device, and a bitmap font for 72-dpi screen display. m



1 Some letters from the designer's original sketch. Pelavin envisioned a font whose letterforms would have subtly curved strokes and whose round areas—like the *o* and the bowl of the lowercase *g* and *e*—would be triangular.





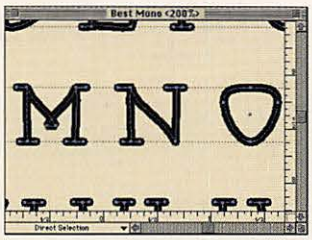


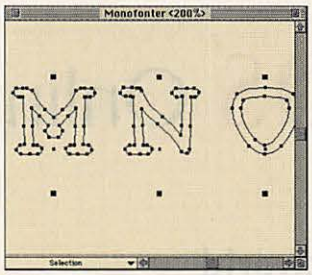
2 Although the characters have no weight when displayed in Illustrator's Artwork mode, the underlying architecture of each letterform is still apparent.

3 In the Paint Style window (Object menu), you define attributes such as stroke weight, caps (ends of strokes), and joins (corners).

THE TOOLS

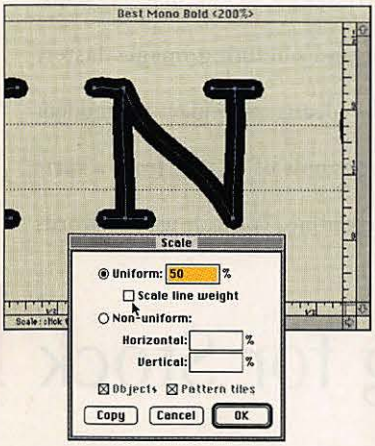
Hardware: Mac IIci with 20MB of RAM and 240MB internal hard drive; APS 128MB magneto-optical drive; Sony 20-inch Trinitron color display; Radius PrecisionColor 24x 24-bit accelerated graphics card; Logitech ScanMan hand scanner; Hewlett-Packard DeskJet 1200C/PS color ink-jet printer; Mouse Systems Little Mouse ADB optical mouse.
Software: Adobe Illustrator 5.0.1; Altsys Fontographer 4.0.3.



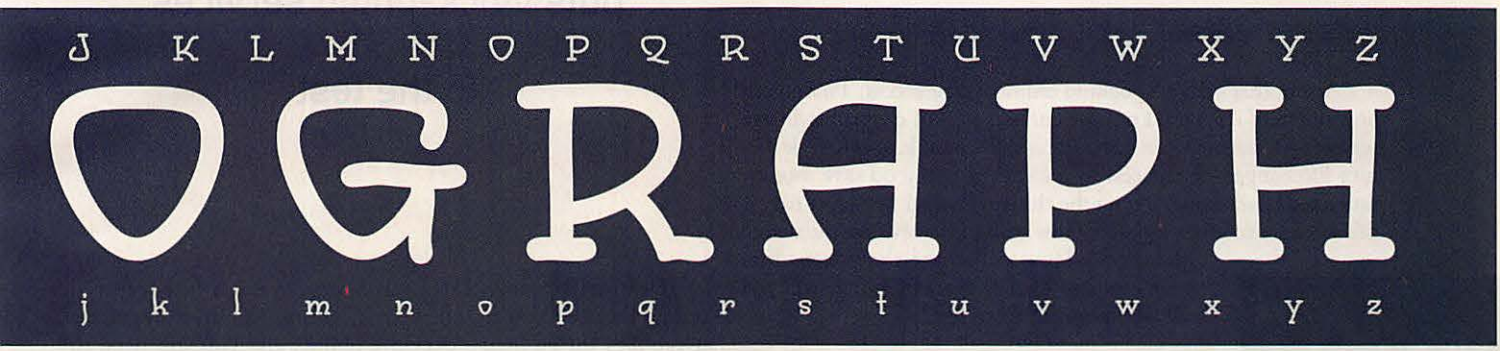


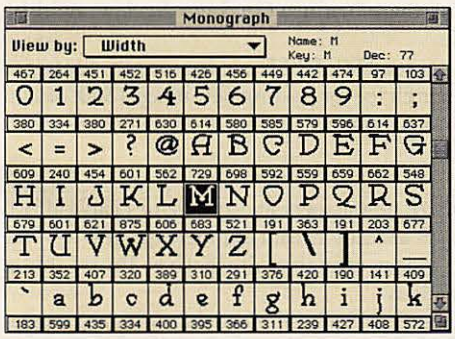
4 Using the paths that make up the letters' skeletons, Pelavin applied the stroke weight and viewed the resulting letter weights in Preview mode.

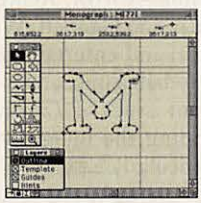
5 To convert the strokes to outlines, Pelavin used the Outline Stroked Path filter (under the Filter menu in the Objects submenu) and the Unite filter to make a single shape out of characters—such as the *M* and the *N*—that were composed of multiple paths.



6 To create Monograph's bold characters, Pelavin scaled all the letters 200 percent with the Scale line weight option checked in the Scale dialog box to uniformly double the weight of all the lines. Then, without deselecting, he unchecked the option and scaled the lines back down 50 percent, which brought the letters back to their original size but kept the line weights doubled.

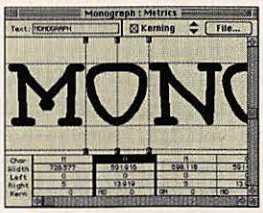




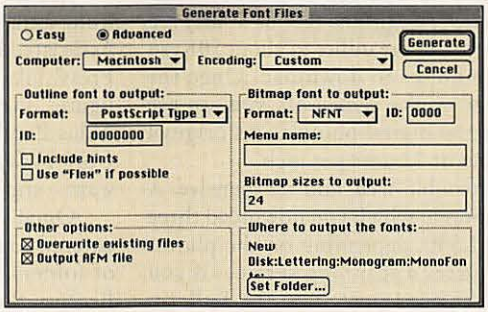


7 He brought the letters one by one into Fontographer by selecting the character, option-copying it to create a PostScript version that Fontographer could read, and pasting it into its own separate Character window.

8 Fontographer's font window, which lets you view all characters simultaneously, can be configured to display such information as character widths, left and right sidebearings (the amount of space allotted for the width of each character, including the space to the left and right of it), and keystroke (the key the letter is mapped to).



9 In the Metrics window, Pelavin set the kerning specifications to control the spacing between certain pairs of letters—such as the capital *T* and the lowercase *o*—for better readability and aesthetics.



10 With everything closed except the Font window, Pelavin chose Fontographer's Generate Font Files command (File menu), setting parameters such as output formats and ID, which facilitates font caching in PostScript printers (so the font will remain in the printer's memory and not be flushed after printing).

ONLINE STOCK-PHOTOGRAPHY SERVICES PROMISE TO MAKE the process of searching for and obtaining images faster, easier, and less expensive. The idea is to connect via modem to a central database with thousands of images from a variety of sources. Once you are online, you can use keywords or phrases to look for the types of images you want, then download candidates as low-resolution thumbnails. When you decide on an image, you can go back online and download a high-resolution version for use in your layout.

Searching for Stock Photos Online

Macworld puts stock-photo services to the test

Again, that's the *idea* behind online image access. To find out how much of it is real, I put the current crop of electronic-image services—Comstock On-Line Access, PressLink, and Kodak Picture Exchange—to the test to see if they really do save money, time, and headaches. Among the things I looked for: How easy is the software to learn and use? How comprehensive are the search capabilities? How usable are the images that you download? And how much money will you really spend using these systems?

ONLINE SPECIAL REPORT

Comstock On-Line Access

Since it has no electronic search capability, Comstock's On-Line Access—which gives you access to 15,000 of Comstock's most popular images—provides a rather piecemeal approach to digital delivery.

You must search for images by flipping through the hefty, printed Comstock catalog included in On-Line Access's sign-up package. When you find the images you want, you dial Comstock's toll-free number using a modem, type in the catalog numbers for the images you want, then download the low-resolution proofs from Comstock's electronic bulletin board. The proofs (about 500K) are compressed with Kodak's ColorSqueeze utility to about 50K, so each proof takes only a few minutes to download. Once the image is on your hard drive and you've signed off, you can use ColorSqueeze to decompress the digital photo to its original size—about 5 inches by 7 inches at 72 dots per inch.

On-Line Access is quick, trouble-free, and inexpensive. A typical, ten-minute online session in which you download three images costs between $25 and $40, depending on the photos you choose. Comstock also offers a scanning service: if you want an image that has not yet been posted on the bulletin board, Comstock will scan and upload a low-resolution version of the photo for you. To receive this service, however, you can expect to tack on Comstock's standard research fee of $60.

Despite its name, On-Line Access is not a full-featured online service. You cannot search online, you must negotiate usage fees for an image over the phone, and you still need to obtain transparencies. But if it is 10 p.m. and your preliminary layout is due tomorrow morning, On-Line Access could be your ace in the hole.

Charges: Sign-up fee $99; $2.85 per log-on; 85 cents per minute of usage; research fee for posting new images $60; design proofs $4.50 to $9 each. **Phone:** 212/353-8600, 800/225-2727.

PressLink

Many small-to-midsize newspapers and magazines can't afford satellite hookups to get a steady stream of timely images. Instead, they're turning to a cost-effective alternative: PressLink, a Knight-Ridder subsidiary.

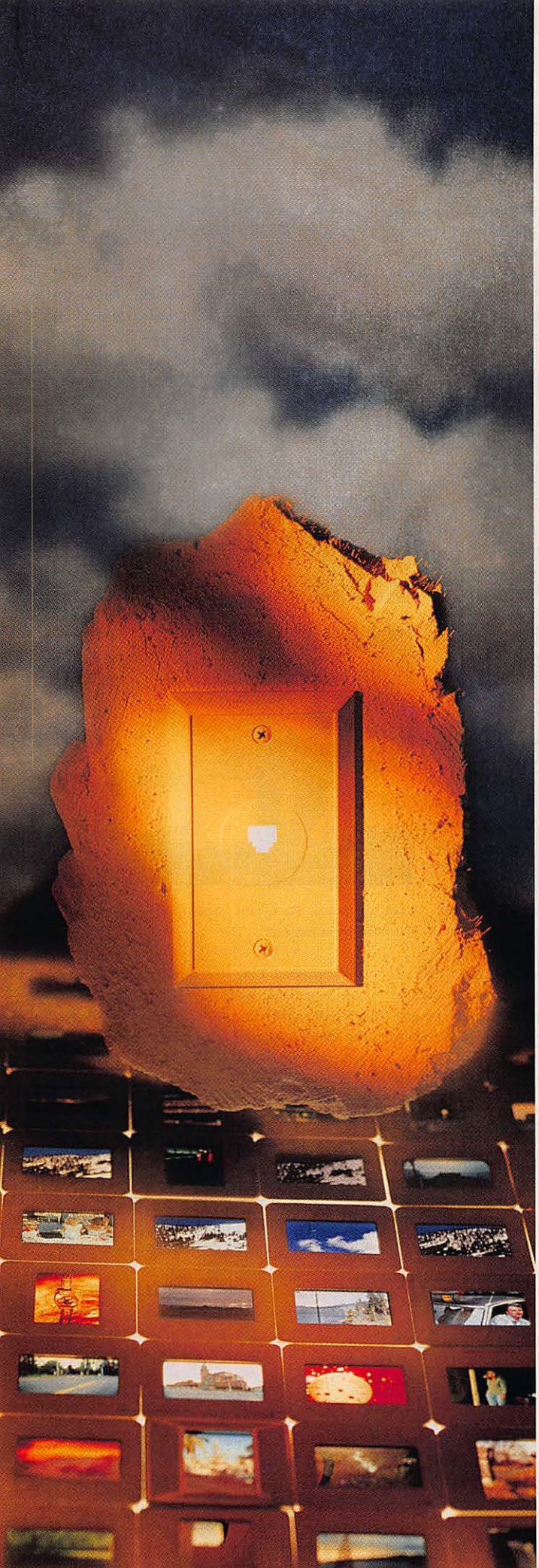
At press time, PressLink offered more than 150,000 images from some 14 media giants, including Times-Mirror, Reuters, Associated Press, United Press International, and Gannett. With PressLink, you can find photos of political and entertainment figures, snapshots of last night's all-star baseball game, and even Aldus FreeHand infographics from current issues of *Time* and *USA Today*. The trick, as always, is finding the images you want—and PressLink doesn't make it particularly easy.

Once you've dialed the local-access phone number and entered your password, PressLink presents you with a screen full of folders, each one representing a particular news service. Because the services try to protect how their images are used, there are no links between them. If you're looking for a photo of last week's hurricane in Alabama, for instance, you have to spend several minutes opening a dozen folders and searching within each one to find the right image.

In addition, the image providers offer only a handful of keywords to identify images. This wouldn't be too irksome, except that you can't whittle down your choices by viewing thumbnails

by Jim Benson

Illustration by Michael Sean



online—you can only read an image's caption. To view thumbnails, you must download them to a folder on your hard drive; each image is compressed to between 8K and 10K using proprietary software and takes 10 to 15 seconds to download. Once they're on your hard drive, you view the thumbnails by double-clicking on a thumbnail file's icon to automatically launch the PressLink Access utility. When you find an image you like, you then log back on to PressLink to retrieve the JPEG-compressed high-resolution version of the image and download it to your hard drive. Each image is 140K to 250K in size and takes between 5 and 10 minutes to download.

High-quality photos don't have to cost a bundle

The good news is that your final, decompressed color image is a healthy 2MB to 4MB in size. Even better, most of the content providers charge little for the images and allow multiple uses over a fixed period of time. UPI, for instance, offers newspapers unlimited use of photos for 90 days for a mere $25 per image. Add that to PressLink's reasonable hourly online rate and download charge, and you'll find that using high-quality photos in your publication doesn't have to cost a bundle.

Charges: Sign-up fee (software included) $50; monthly service fee $9.95; $15.95 per hour of usage; all downloaded information costs $.0575 per thousand characters; content providers charge usage fees of $25 and up for high-resolution images. **Phone:** 703/758-1740.

Kodak Picture Exchange

At press time, 17 stock-photo houses—among them FPG, PhotoBank, and ProFiles West—had contributed nearly 100,000 images to Kodak Picture Exchange (KPX). But unlike those on PressLink, every KPX image (the majority are in Kodak's Photo CD format) carries a detailed description that follows Kodak's specifications. This makes it possible to search all of the content providers' images simultaneously.

Of the three services I tested, KPX comes closest to delivering on the promise of online image access. The software is easy to learn; I was able to perform simple searches and download images without cracking open the manual. The service is fast (KPX supports 9.6-Kbps, 14.4-Kbps, and ISDN transmissions) and powerful—even complex searches showed the number of hits within a few seconds, and I could quickly narrow my search criteria for a manageable range of images.

Here's a typical session. After launching the program—which automatically dials KPX's toll-free number—and choosing from a list of image providers (you can select them all if you want), you're ready to start searching. For a simple search, you can type a few keywords, such as *children and dogs;* within a few seconds you'll see the number of images found that fit your request. (The above search yielded 133 hits.)

You can then choose how many thumbnail images you want to see and at what sizes—small (32 by 48 pixels), medium (64 by 96 pixels), or large (128 by 192 pixels, the same as the smallest Photo CD resolution). The program automatically downloads all thumbnails to your hard drive. For maximum speed (but minimal visual appeal), you can also download only the text description of an image.

KPX makes it relatively easy to perform more complicated searches, too. In the children-and-dogs example, I narrowed my search to include only images of a boy and a dog, in vertical format, with space at the top for a headline; using those criteria, my search yielded nine images. I could then pick from those images and download a 256-by-384-pixel design proof.

Once you've made your decision, you can order an image

Taking Stock of CDs

Thanks to the growing ranks of CD-ROM–drive owners, a new means of distributing images is gaining popularity—high-resolution stock-photo CDs. Unlike the catalog CDs published by such stock agencies as FPG International—which typically contain thousands of low-resolution (usually 72-dpi) images for on-screen browsing and use in comps—CD photo collections often contain between 60 and 400 electronic images at 300-dpi resolution that are suitable for printing at sizes ranging from 5 inches by 7 inches to 15 inches by 10 inches at a 150-line screen. (All the CDs reviewed here also offer low-resolution versions of the images for browsing and multimedia use.)

Unlike using a stock-photo agency, where you pay for every use of the image you choose, purchasing a stock-photo CD generally enables you to use any image on the disc as many times as you like, without additional charges.

I evaluated more than 50 high-resolution stock-photo CDs, keeping an eye toward image quality as well as aesthetics. From that pile, the following three multiple-disc, wide-ranging image collections and three single-disc, general-purpose collections were standouts.

Multiple-Disc Collections

COREL PROFESSIONAL PHOTOS Easily the largest collection of high-resolution images on CD, the Corel Professional Photos series offers more than 100 specific categories—one category per disc—to choose from. Most of the CDs deal with travel, animals, or plants, although the collection is expanding to include subjects such as law, business, and residential interiors. Most images have noticeable imperfections, and more of these photographs need color adjustment than on the other discs I reviewed. But with 100 Photo CD–formatted images on each $49.95 disc, I can't complain. Corel, 613/728-3733, 800/772-6735.

DIGITAL STOCK'S PROFESSIONAL SERIES Excellent color balance, superior compositions, and only an occasional scanning imperfection characterize this collection of 20 CDs (100 images per disc). Digital Stock CDs cover the breadth of images; among the disc categories are Active Lifestyles and Buildings and Structures. Included in the collection is a Signature Series; each disc highlights the works of a particular photographer. All Digital Stock images are in Photo CD format. Each disc is $250 (10 percent discount for 5 to 9 discs; 15 percent for 10 or more; Signature Series discs are $350 each). Digital Stock, 619/794-4040, 800/545-4514.

PHOTODISC Like Digital Stock's, PhotoDisc's images cover the gamut of subject matter and are well chosen and nicely framed. You get a greater quantity of images on a PhotoDisc CD—most have 336 photos—than you do with Photo CD–formatted discs, but the PhotoDisc images are slightly smaller. There are currently 13 discs in the series; volumes 1 and 2 have too many scanning imperfections and dark midtones, but a PhotoDisc company representative said that rescanning those images is a top priority and that there will be a nominal upgrade charge for anyone who already owns the volumes. PhotoDisc images are compressed via JPEG; each disc contains between 111 and 409 images and costs $299 (except for volume 3, which goes for $199). PhotoDisc, 206/441-9355, 800/528-3472.

Single-Disc Collections

COLORBYTES SAMPLERS ONE AND TWO Although a bit heavy with nature shots, these two general-purpose discs have the best-scanned images of any I reviewed. They offer excellent color balance and large images sizes—several megabytes larger than even the maximum size supported by the Photo CD format. One annoying restriction: you must include a credit line for the photographer if you use any part of a photo. Images are compressed in JPEG format; each disc contains 100 images and costs $399 (discounted indefinitely to $249). ColorBytes, 303/989-9205, 800/825-2656.





Stock photos from Electric Iris Signature Series (top) and the PhotoDisc Series (bottom).

ELECTRIC IRIS SIGNATURE SERIES, VOL. 1 NO. 1 This is perhaps the most wide-ranging single-disc collection of stock photos around. The $129 disc offers 60 RGB TIFF images from photographer Chris Grajczyk; they include both the expected (sunsets and children) and the unexpected (a body in a morgue). The images are nicely composed but grainy, with colors a bit oversaturated. Digital Knowledge, 612/595-0801, 800/279-6099.

Left to right: ColorBytes; Corel Professional Photos; Digital Stock.







online. But here's where KPX disappoints by regressing to the timeworn tradition of phone negotiation. After you specify how you'll use the image (for example, book cover, 10,000 print run, and USA only), KPX electronically routes your order to the appropriate image provider, and a representative of the provider calls you with a price. It seems logical that prices for some images might need to be negotiated; but if I'm browsing online, I like to have an idea right then and there what a particular image will cost. After all, price can be a big part of my decision.

Another caveat, particularly for those on a tight deadline, is that KPX currently can't download high-resolution files via modem. So if you need the image today, you're out of luck. You can receive an image on a Photo CD or transparency via next-day air delivery, however, and the company says that a future version of KPX will let you download high-resolution files.

KPX seems pricey—the sign-up fee alone is $399—but if you frequently request stock photos from a number of agencies, you could realize substantial savings in the long run. If you were to make search requests from four stock houses, for instance, chances are that each agency would charge you a $60 research fee—a total of $240. Add to that, $30 in round-trip, rush airfare charges for each stock-house mailing, and that's another $120—for a grand total of $360. Deduct $60 as a rebate from the agency through which you eventually license an image, and you've still paid $300 just to find the image you want.

Using KPX, a novice can easily search and download 50 thumbnails from a variety of image providers in 30 minutes; experienced users will need only half that time. That translates to research costs of between $21.25 and $42.50, based on KPX's $85-per-hour online usage fee. Throw in $30 for a typical design proof and another $30 for round-trip transparency or Photo CD delivery and return, and you're still at around $100 per image (not including your sign-up fee).

Charges: Sign-up fee (includes software and two hours of free usage) $399; $85 per hour of usage; design-proof download fees $9 to $50. **Phone:** 716/473-7300, 800/579-8737.

More to Come

By the time you read this, Picture Network International, or PNI (703/558-7860), is expected to go online with Seymour, a direct competitor to KPX aimed at designers, ad agencies, book publishers, newspapers, magazines, and multimedia producers. At press time, 14 providers have supplied the system with images, and as many as 15 more are expected by year's end.

Seymour will sport a snazzy interface and let you search by natural-language phrases (such as *three executives talking in front of a building*) instead of keywords. Thumbnails and design proofs will come in TIFF format, proofs will be as large as 700K (591 by 394 pixels), and the system will support modem speeds between 9.6 Kbps and 28.8 Kbps.

With Seymour you'll be able to get the exact price of any image (based on your usage), order it, and obtain a high-resolution version by downloading a Photo CD file. (The maximum Photo CD image size is 2048 by 3072 pixels.) If you prefer, PNI will also send the image on a Photo CD or SyQuest cartridge, or as a transparency.

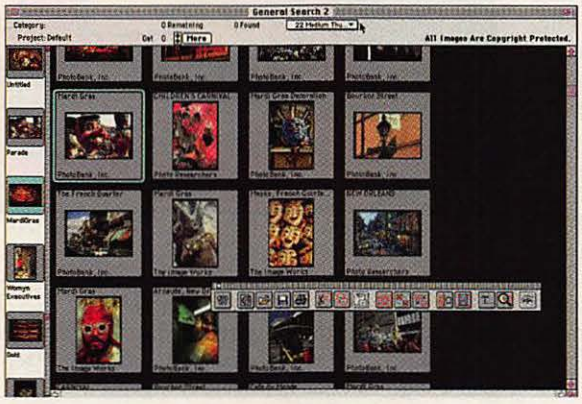
Meanwhile, Microsoft chairman Bill Gates's search for images to use on the HDTV screens in his new home has unfolded into a new company, Continuum Productions Corporation (206/641-4505, 800/677-4172). Continuum's mission is to develop a digital archive of multimedia content. At this point in its evolution, the company is focusing on licensing and obtaining still images from photographers, museums, libraries, the public domain, and private archives and institutions. Images are being scanned at HDTV resolution (2000 by 3000 pixels), cataloged, and assigned keywords. The company also plans to develop a visual online navigation system. Although Continuum is currently providing images to producers of multimedia titles, by the time you read this the company will be making images available online to other users as well.

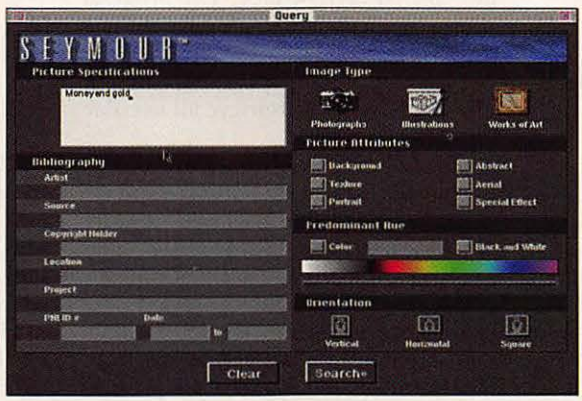
Picturing the Future

We're moving toward a scenario in which art directors never touch an actual transparency from a stock house. In fact, if you use KPX, it's quite possible to accomplish that feat today. By the end of the decade, online image databases will have millions of images cataloged, and using them will likely become de rigueur.

So why aren't the visionary systems reviewed in this article going great guns today? (The largest of them, PressLink, boasted a mere 3000 subscribers at press time.) One reason is that they're relatively new, but a bigger obstacle is technophobia: say the word *modem* to many designers, and their eyes glaze over—that is, until they actually use one for an online joyride. Then they're hooked.

If you frequently use traditional stock-photo agencies, give their online counterparts a whirl. If you like Comstock's images and use them frequently, you should consider signing up with On-Line Access. If you prefer to shop at a number of stock houses, by all means try out KPX. And if you need low-cost images of current events, PressLink should fill the bill. These services—and others coming down the pike—are making it easier and cheaper than ever to load your Mac with the images you need. **m**





Two Stock Services It pays to be specific when you search on Kodak Picture Exchange (top). A request for images with the keyword *Mardi Gras* was rewarded with 22 hits (some of which are shown here), but only half of the images were actually of Carnival; the others were generic New Orleans scenes. Typing *Mardi Gras and costume* whittled the number of hits to 6. Seymour (bottom), from Picture Network International, will have the sharpest-looking, easiest-to-navigate interface of any online stock-image service. You can easily view a wealth of information—such as image orientation and photographic attributes—about a particular image. Seymour should be online by the time you read this.

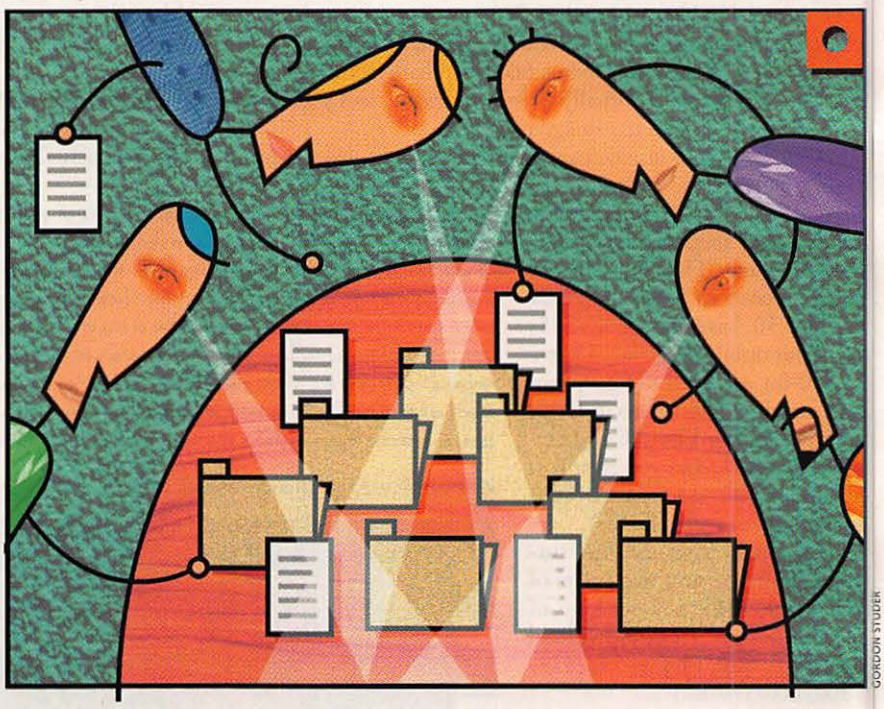
Designer/writer JIM BENSON is coauthor, with Cher Threinen Pendarvis, of the upcoming *The Painter WOW! Book* (Peachpit Press).

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

FileMaker Goes Client/Server



GORDON STUDER

CLARIS IS DEVELOPING A new version of FileMaker designed to make sharing FileMaker databases across a network viable.

FileMaker Pro Server will run on AppleTalk networks and be able to drive databases created in FileMaker Pro 2.0 or 2.1. The server version will open up to 16 databases at once, and juggle tasks such as searching or sorting by interrupting one task to start another and threading multiple tasks. It will run on 680X0 systems, or in native mode on Power Macs. FileMaker Pro Server will list for $1499 and should ship in July.

Claris is also developing a run-time engine that can be incorporated in FileMaker databases. For commercial-application developers, there is no license fee for distributing the run-time engine; the cost for in-house developers will vary based on quantity. The run-time will be sold as part of FileMaker Solutions Development Kit, a CD-ROM that will include FileMaker tips and predesigned buttons. It should ship in July for $499 and will be available only to members of Claris's FileMaker developers organization, Claris Solutions Alliance. Claris, 408/727-8227.—D.L.

The Independent Invoice

MYSOFTWARE IS SHIPPING MyAdvancedInvoices, the Mac's first stand-alone invoicing package.

MyAdvancedInvoices can generate a bid and convert it to an invoice when the bid is accepted. The program includes a number of preset reports; it can create summary and detail reports of accounts receivable, customers, and invoices (plus sales-tax, receipts, and trend reports). You can select a date range for reports; change field names; sort data based on any field; add a logo to your invoices; and print a message on each invoice. The program allows you to enter a single discount rate for all customers. It lacks calculations in its searching and reporting; for example, it is not possible to retrieve all overdue invoices over $1000.

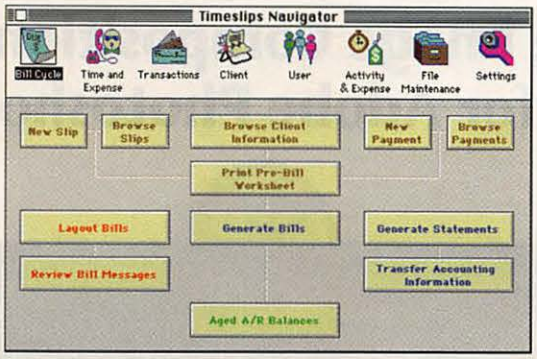
MyAdvancedInvoices is also designed to transfer data to MySoftware's other Macintosh products—MyDatabase, MyAdvancedDatabase, MyMailList, and MyAdvancedMailList—making it possible to generate collection letters, direct-mail pieces, and so on. Version 1.0 does not communicate with software from other vendors, but MySoftware plans to add that capability to an upgrade.

The list price for MyAdvancedInvoices is $59.95. MySoftware, 415/325-9383, 800/325-3508.—D.L.

Timeslips Retooled

TIMESLIPS CORPORATION IS DEVELoping version 2.2 of Timeslips III, time-billing software for professionals who charge by the hour. The new version will be able to manage complex billing rates and will sport a redesigned and more accessible interface.

Timeslips 2.2 will support a matrix of billing rates to charge different hourly



Among the additions to the new version of Timeslips is a navigation window that provides you with one-click access to all of the various parts of the program.

rates based on who in an office does the work, who the client is, and what activity is performed. The new version will also include a navigation tool that simplifies gaining access to common functions. Version 2.2 is expected to ship in August for $299.95. At the same time, Timeslips will ship an upgrade to its PowerBook time-billing program, LapTrack; the new version, 1.1, has a refined interface. LapTrack will list for $79.95. Timeslips also sells links to several popular accounting packages, which can eliminate having to reenter data in your accounting package.

TimeSlips is also working on a time-billing product for the Newton, but its name, price, and ship date were not set at press time. Timeslips, 508/768-6100.

—JOANNA PEARLSTEIN

Mac Automates Credit Card Sales

HAS YOUR BUSINESS BEEN BURNED because verifying credit card sales manually seemed like too much trouble? Do you need to automate the whole point-of-sale process? MacAuthorize, which is being upgraded to version 2.0, verifies credit card transactions over bank-card networks and then deposits the sale in your account—without leaving your sales or customer database.

Salespeople feed credit card information into MacAuthorize with a credit card reader (MacAuthorize works with readers from TPS Electronics and Time-Keeping Systems) or by keying the information into the Mac using a data entry screen that resembles a credit card slip—the kind stores run through those clunky imprinters. MacAuthorize then dials the bank-card network for approval. Depending on the network used, funds are deposited after each sale or at the close of the business day. Version 2.0 automatically deducts the bank discount on each sale (the fee charged for using the network, generally between 1 and 5 percent). Using Apple events, you can access MacAuthorize from within databases such as 4D and FileMaker Pro.

Version 2.0 should ship before you read this. Its price was not set at press time, but it will be more than the $315 cost of the current version. Free demo versions of MacAuthorize are available from online services including America Online and CompuServe, or from Tellan Software at 408/274-1110 or 800/483-5526.—SUZANNE COURTEAU



TOM GIBSON

MacAuthorize is software that verifies credit card charges for telemarketing or for a point-of-sale system like this one.

OCR That Thinks?

LIGATURE SOFTWARE WANTS TO ADD some brains to optical character recognition with CharacterEyes, an omnifont OCR program that uses neural network technology to improve speed and recognition accuracy.

Like all omnifont OCR programs, CharacterEyes identifies a character's major features, such as crosses and loops, and tries to match them to the features of common fonts. To find matches, CharacterEyes uses neural network technology, which works much like the brain, with its many connected neurons, to interpret ambiguous data such as the dot pattern of faxed text. Ligature says the neural net improves the program's success with difficult-to-read fonts and poor-quality documents. You can train CharacterEyes to recognize fonts that its omnifont engine can't decipher.

Ligature claims CharacterEyes achieves a real-world recognition rate of 200 characters per second with 99.6 percent accuracy. Additionally, CharacterEyes retains document attributes such as columns and tables, and the program can batch-process stored TIFF files, check the spelling of text, and export recognized text in Microsoft Word and WordPerfect format. It incorporates Hewlett-Packard's AccuPage technology and supports most major flatbed scanners. CharacterEyes lists for $695. Ligature Software, 617/272-3085.—JIM FEELEY

IN BRIEF

■ **Great Plains' Server Strategy** Great Plains is developing a client/server engine for its Dynamics accounting series. To be called Dynamics C/S+, the server will require a TCP network and will run on Power Macs, as well as on Windows machines and Unix-based minicomputers from Sun, Hewlett-Packard, and IBM. It should ship this fall; pricing will depend on the number of users, ranging from $5000 for eight users up to $40,000. C/S+ is being developed to work with version 2.0 of the Dynamics modules, which should be shipping when you read this; pricing depends on module. 701/281-0550, 800/456-0025.

■ **U.S. Phone Book on CD-ROM** Digital Directory Assistance is shipping PhoneDisc, three versions of CD-ROMs containing U.S. telephone numbers. The $79 PhoneDisc Residential has 81 million listings that include name, phone, and address; the $79 PhoneDisc Business has company name, address, phone, and Standard Industrial Codes (SIC) for 9.5 million businesses; and the $249 PhoneDisc Reverse includes residential and business listings and can search by name or phone number. 800/284-8353.

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MacWEEK, January 24, 1994



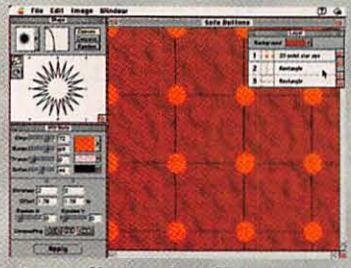
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Circle 41 on reader service card



BY JIM HEID

Working Smart

Mac-Integrated Telephony

DOES PLUGGING YOUR MAC INTO THE telephone grid make you think only of modems and fax modems? Macs can reach out and touch more than just fax machines and other computers. With the right add-ons, a Mac can dial customers in your contact database and leave them a message; a Mac can also be the hub of a voice-mail system, or of an automated fax-back system, which lets your customers dial in and get product brochures, technical updates, horoscopes, or whatever, sent to their fax machines.

Telephony is a hot trend in computing, and Apple is actively involved in it. Besides building telephony capabilities into the AV and Power Macs, Apple is enhancing the Mac's system software with support for third-party telephony software and hardware. While many of Apple's plans are still on the drawing board, here's a look at some useful ways a Mac can tie up a telephone line today.

Dial the Number

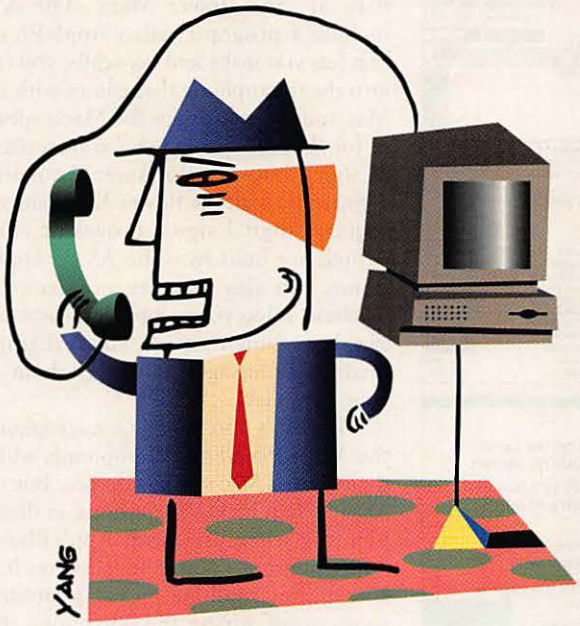
Once you have entered a phone number into a database, an E-mail message, a text document, or anywhere else, why should you have to dial it manually? Automatic phone-dialing can save your fingers from unnecessary walking.

There are a few routes to autodialing. Many personal information managers (such as Aldus TouchBase Pro) can dial using your Mac's modem, and you simply pick up the phone before the phone on the other end starts to ring. This scheme has several flaws. For one, it assumes that your modem and telephone use the same phone line—unlikely in any business employing more than one person.

Many programs can issue the tones needed to dial as you hold the telephone handset up to the Mac's speaker. But in my experience, this method works poorly—too many wrong numbers and incomplete calls. And, of course, you can't dial this way at all with phone systems that require pulsed dialing.

(To test the waters of autodialing, QuicKeys owners can take a look at the Phone Dialer extension. To find Phone Dialer, pull down the QuicKeys Extensions submenu, then the Network and Device Tools submenu.)

A better way to dial is to hook up an autodialing box between the Mac and a telephone. I tested two: Sophisticated Circuits' Desktop Dialer and Advanced Software's TurboDialer. Each has good and bad points. The TurboDialer connects to the Mac's sound-output jack, blocking the port for external speakers. The Desktop Dialer connects to the Apple Desktop Bus (ADB) along with your mouse and keyboard—a much more flexible scheme.



The TurboDialer can dial a number as soon as you select one, but the Desktop Dialer requires you to copy the number to the Clipboard, which adds a step to the dialing routine and replaces the Clipboard's contents. But to its credit, the Desktop Dialer can be driven by any program that can send Apple events, such as Claris's FileMaker Pro or Apple's HyperCard. Desktop Dialer also includes a bare-bones address-book program that stores up to 20 names and addresses. In all, it's the better of the two dialers, and most contact managers and other dialing-aware programs support it directly.

Area codes and long-distance access codes can be a problem. You want an autodialing program to dial the codes for long-distance calls but not for local ones. How does the program know which is which? Both dialers use a simple scheme, which begins with your entering the local area code in a setup dialog box. When you go to dial a number, the dialer's software checks the number's area code and doesn't dial it if it matches the area code in the setup dialog.

Both dialers also let you specify prefixes for accessing outside lines or long-distance services; you can insert a pause between the prefix and the number by typing a comma after the prefix. Both dialers also support the suffixes—your calling-card number—that many long-distance companies require.

Plug into the Grid

Apple is pushing telephony by building GeoPort connectors into the AV Macs and Power Macs. The GeoPort promises to do for telephony what LocalTalk did for networking: make the hardware connections easy and economical.

The AV and Power Macs have enough processing horsepower to perform the tasks of a high-speed modem or fax modem, so they need only a hardware interface to the telephone lines. That's where the Apple GeoPort Adapter comes in—it's a simple interface box that plugs into the GeoPort and connects the Macintosh to analog phone lines (the

continues

JAMES YANG

"FirstClass Outperforms Competitors Easily" BYTE Magazine 09/93

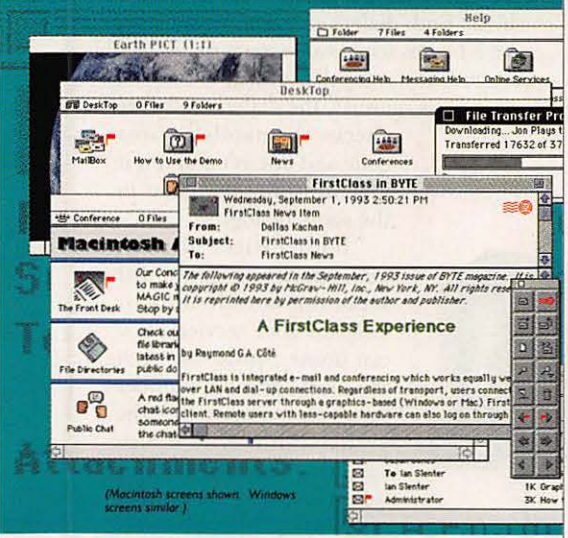
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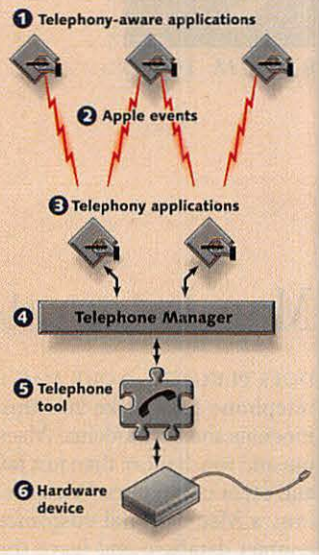
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Circle 299 on reader service card

How Mac System Software Assists Telephony

Apple's Macintosh Telephony Architecture enables telephony products to work together, even those not designed specifically to do so, by using Apple events and the Telephone Manager extension to manage communication between the applications, drivers, and hardware that connect Macs and telephones.



At the Architecture's top layer are telephony-aware applications **(1)**—for example, a database that records order-entry information delivered by telephone, or a contact manager that looks up a contact's number and exports it to a dialer.

Apple events **(2)** carry messages between telephony-aware applications and telephony applications **(3)**, such as an answering-machine program, a graphical switchboard, a voice-mail system, or an automated paging system.

The telephony application in turn communicates directly with the Telephone Manager extension **(4)**, which then talks to telephone tools **(5)**—low-level drivers that control specific pieces of hardware, such as a modem or dialer **(6)**.

kind that you probably have in your house).

The GeoPort isn't just for data—it can also carry voice. At this writing, the 68040-based AV Macs—the Centris/Quadra 660AV and the Quadra 840AV—are better equipped for voice telephony than are the Power Macs. The AVs include a program called ApplePhone that lets you make and take calls: you talk into the microphone that comes with the Mac and listen through the Mac's speaker (or through headphones connected to its sound-output jack). ApplePhone isn't compatible with the Power Macs, since it requires digital signal processor chips (which are built into the AVs). ApplePhone can also serve as an answering machine. It lets you record and play a digitized outgoing message, and it digitizes incoming messages and saves them on your hard disk.

The AVs also include a microphone, the Apple PlainTalk Microphone, which their Power Mac siblings do not. But the Apple PlainTalk Microphone is disappointing when used with ApplePhone. The outgoing-volume level is too low, and the microphone picks up ambient room noise, giving the AV phone that annoying speakerphone echo.

A smarter way to put AV telephony to work is with Jabra Corporation's Ear Phone AV/Power Mac (see *Reviews*, *Macworld*, July 1994). This remarkable little gizmo looks like a standard earphone but has a sensitive microphone inside. The Ear Phone's two cables plug into the Macintosh's sound-input and sound-output jacks. The Ear Phone itself plugs into your ear—it's fairly comfortable, although after an hour or so you become increasingly aware of its presence.

If you use PlainTalk's voice-recognition, you'll be glad to know that the Ear Phone works with it. In fact, recognition accuracy with the Ear Phone is a bit better than with the Apple microphone, because the Ear Phone microphone is fixed at a constant distance from your mouth and because Jabra's engineers fine-tuned the audio levels.

Desktop Voice Mail

Like them or not, voice-mail systems are coming on strong. Dedicated voice-mail systems start at about $4000 and skyrocket into the six-figure range, whereas Mac-based systems such as Cypress Research Corporation's PhonePro and Magnum Software Corporation's TFLX (pronounced *tee-flex*) start at several hundred dollars (not including the Mac, of course). Neither PhonePro nor TFLX is limited to voice mail—other uses include calling numbers in a database and playing a recorded message (a doctor's office might use this to set up an automatic appointment-reminder system); automatic order entry (callers enter item numbers from a catalog, and the system records the order); or telephone surveys (the system plays multiple-choice recordings and callers press keys to respond).

Every voice-mail system is a program that plays a message, records a message, transfers a call, and so on in response to keys pressed by the caller. To tailor a voice-mail system to your business, you must create the program that tells the system what to do. PhonePro and TFLX take remarkably similar approaches to the programming task. Both provide graphical programming environments, so you

continues

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Apple made it easy to use. We make it easy to do.



In fact, we'll do it for you. Introducing Open Sesame!, the world's first intelligent software assistant for the Macintosh. Open Sesame! observes how you work, *learns* your repetitive patterns, and then offers to do them for you. Automatically.

With a single click, Open Sesame! will open and close related sets of folders, documents and applications, create and manage multiple Apple Menu and Desktop items folders, and perform routine maintenance, like rebuilding your desktop...automatically. So you can do more with fewer clicks.

For example, suppose that every time you start up your Macintosh you immediately open your mail program. Open Sesame! will observe this and offer to do it for you. It will even find more efficient ways for you to use System 7.0, like making aliases and stationery automatically.

Here's what the critics say: "One that knocks my socks off is called Open Sesame! ...the simple fact is that Open Sesame! works smarter for me. It might just herald a new wave in mac smartware. ...The more you use it the better it gets." The Mac Manager, *MacWEEK*

"Macintosh users who like the flexibility of System 7 but tire of "tweaking" their desktop and Apple menu items will appreciate Charles River Analytics Inc.'s Open Sesame!" *INFOWORLD*

Open Sesame! is available at these quality resellers: MacWarehouse 800-255-6227, EGGHEAD 800-EGGHEAD, The Mac Zone 800-248-0800, ComputerWare 800-326-0092.

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Circle 18 on reader service card

program by dragging and linking icons that represent tasks and functions, and the end result looks more like a flowchart than a computer program.

PhonePro normally includes a high-speed SupraFax Modem (from Supra Corporation) upgraded with a chip that enables the system to play outgoing messages. For recordings to get through the Mac's modem port, they must be compressed in a way that compromises fidelity. TFLX doesn't have this sound-quality problem. It uses custom hardware between the phone line and the Mac's sound-output jack. Outgoing sounds are decompressed and played at the Mac's standard 11kHz or 22kHz sampling rate, which yields dramatically better fidelity.

TFLX's programming language is also more robust than PhonePro's. This isn't to say that you can't program complex systems in PhonePro—you can—but TFLX's language gives you more ways to express yourself, telephonically speaking. On the downside, I found the TFLX software a bit rough around the edges; PhonePro has a more polished feel to it.

Magnum has created an impressive demonstration of TFLX. Call 818/701-5051 and ask for the TFLX demo. If you call after hours (Pacific time), you're connected to the demo automatically.

WHERE TO BUY

Apple GeoPort Adapter $129; **Apple Remote Access** $199 (Apple's estimated prices); Apple Computer, 408/996-1010.

Desktop Dialer 1.4 $75; **PowerKey** $119; **PowerKey Remote** $49; Sophisticated Circuits, 206/485-7979, 800/827-4669.

Jabra Ear Phone AV/Power Macintosh $169; Jabra Corporation; 619/622-0764, 800/327-2230.

PhonePro 1.2 $349, with modem $950; Cypress Research Corporation, 408/752-2700.

TFLX 5.2 $495 to $1750; Magnum Software Corporation, 818/701-5051.

Timbuktu/Remote 3.0 one user $195, two users $295; **Timbuktu Pro 1.0** $199; Farallon Computing, 510/814-5000.

TurboDialer $79.95; Advanced Software, 408/733-0745, 800/346-5392.

Telephony from Afar

Telephones are, by their nature, for communicating from a distance—the prefix *tele* comes from the Greek for "far away"—so it's no surprise that there are plenty of tools for accessing your Mac-integrated telephone system from outside the office.

- Remote access: With Apple's Apple Remote Access software (ARA), you can dial in to the office network and use its printers, file servers, and E-mail. A remote network node can do anything a local node can do, albeit in slow motion; even with a 14.4-Kbps modem, accessing a remote network feels a lot like trying to run in a swimming pool.
- Remote control: Using ARA with Farallon Computing's Timbuktu Pro, you can actually control a remote Mac. From home, you can run programs on your office computer, open its documents, and see its screen—but again, in slo-mo. Note the subtle but important difference between Apple Remote Access and Timbuktu: ARA gives you access to a remote network and its services, while Timbuktu Pro gives you access to a remote Mac; you can't control or view the screen of a remote Mac using ARA alone. (If you're on a budget, buy Timbuktu/Remote, which has fewer features than Timbuktu Pro but doesn't require ARA.)

The Trouble with Telephony

For all its promises, some aspects of computer telephony still have rough edges. For example, most people have separate lines for modems and voice phones, but Macintoshes don't support this basic requirement. Another problem is that Apple's GeoPort Adapter works only with analog phone lines, and many businesses have digital phone systems. Apple has been saying that PBX-compatible GeoPort adapters would be available since the AV Macs were released last year, but none have appeared to date.

Finally, it's impractical and expensive to dedicate a Mac as a simple answering machine or telephone. Conventional phones, answering machines, and fax machines aren't about to go the way of the telegraph key. At least for the time being, computer-based telephony tools will supplement, rather than supplant, the phone equipment to which we've become addicted. **m**

Next month: Word 6—Best and Worst

Contributing editor JIM HEID has been writing about the Mac since its introduction. His latest books are *Macworld Complete Mac Handbook Plus CD* (1993) and *Macworld Word 6 Companion* (1994), both published by IDG Books Worldwide.

Style with Purpose

Joule™ cable-free modular storage systems offer advantages that tower above the rest.

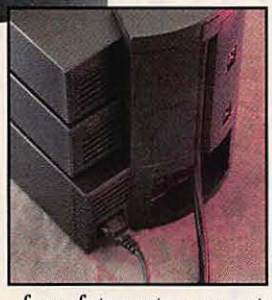




The Joule system was designed to meet a powerful combination of purposes. To provide system expandability, and module portability in a space saving tower that grows without desk-top clutter, as easy as 1,2,3.

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> Leppo Instruments

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eleven packages that

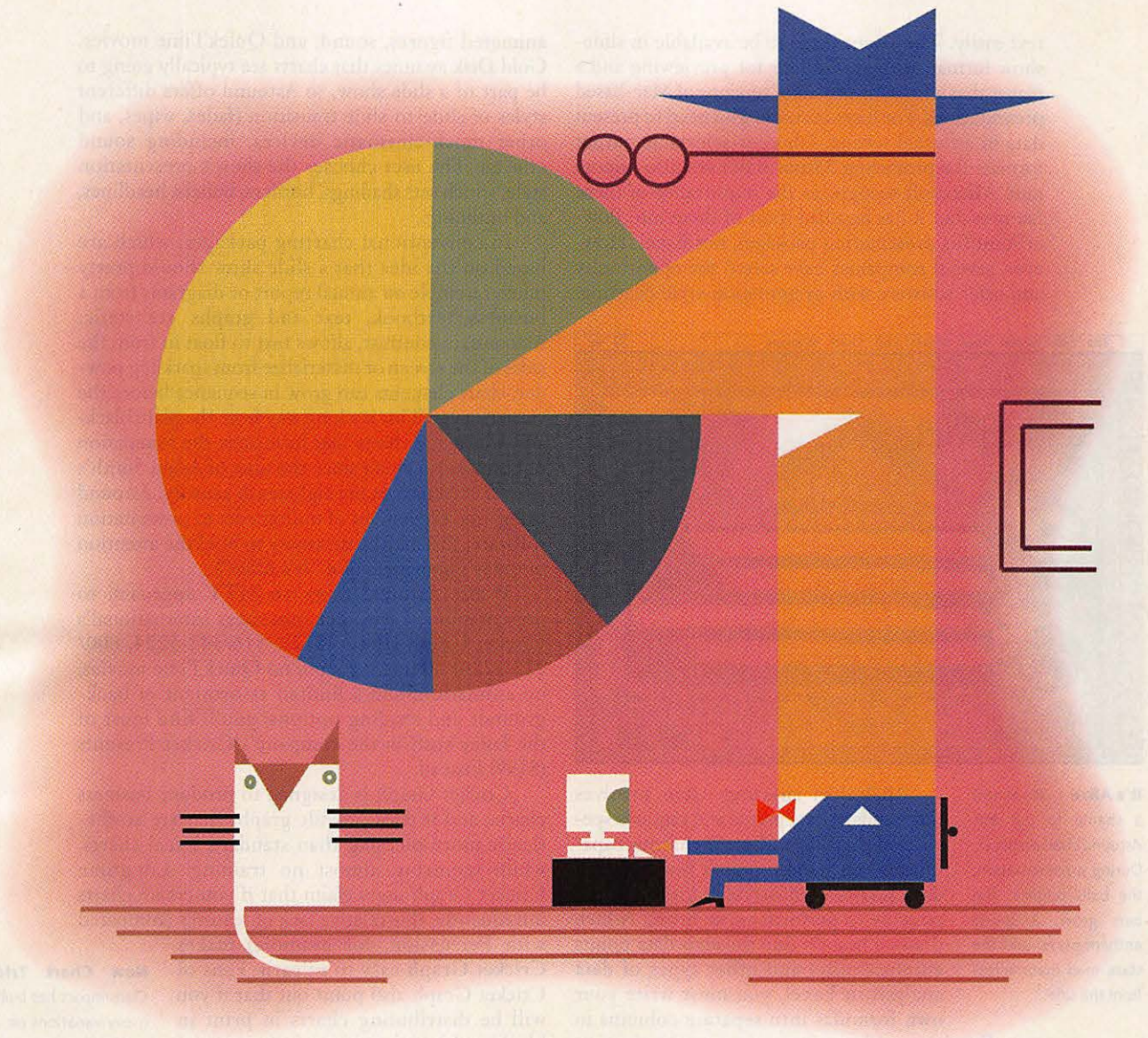
Graphing beyond Excel

BY CHARLES SEITER

Graphing software exists for one simple reason: it's difficult to perceive meaning directly from numbers. By presenting numbers as quantities that you can compare, graphing software makes numerical information more meaningful. The earliest number systems reflect this: Roman numbers and Chinese numbers both, for example, display the number three as a set of three lines. The Sumerian way to tally ten cows was to put ten little clay models of cows in a clay box, an early form of the pictographs you see today in newspapers.

Modern incarnations of those ancient representations—bar charts, line charts, and pictographs—are available to nearly all Macintosh users; even word processing programs typically include modest charting modules. For professional charting and graphing (the terms are interchangeable) in the Mac software universe, there are two types of graphs. First are the ones you can create with the ever-expanding feature set of Microsoft Excel, the standard Macintosh spreadsheet program.

In the second category are graphs that require features that go beyond Excel's limits. This category can be further divided into business and scientific



TERRY ALLEN

offer sophisticated charting features

graphs. While both groups of products provide advanced charting features, there's a basic distinction between programs designed for business use and those designed for scientific use. For presenting small amounts of data in a visually interesting way (showing off yearly revenue growth, for example), business-charting packages are filled with features that let you highlight the message contained in your numbers. However, for seeking an underlying rule that unifies or explains lots of data covering a wide spectrum of time or other unit of measurement, scientific-charting packages offer advanced analytical capabilities that identify the significance of data and display its meaning graphically.

Whether your goals are business or scientific in nature, all commercial charting packages typically go beyond Excel (and also beyond the charting features of integrated packages such as ClarisWorks, Microsoft Works, and WordPerfect Works). The 11 charting programs *Macworld* compares will help you present your data in ways that Excel can't, or at least can't do easily.

What They Do That Excel Can't

Although Excel 4.0 ($495, Microsoft Corporation, 206/882-8080, 800/426-9400) has a solid range of charting facilities, plus Wizards that simplify the process of creating charts, it lacks several key features. For example, business users typically want a set of attractive, consistent formats that mix charts and

text easily. They want these to be available in slide-show format, with an outliner for previewing and a player that allows for run-time versions of Mac-based presentations. For business users who need to present data in a formal setting, Chooser-selectable output formats for producing 35mm slides are also important. Microsoft recognizes the importance of these features, but it has bundled most of them into PowerPoint (its presentation package), not Excel. However, several companies have seized the opportunity and offer software with presentation-style charting.



It's Alive It's almost a shame to put this Astound chart on paper. During a presentation, the balls bounce, the bars grow, a sports anthem plays, and the state map materializes from the side.

Analytical charting often involves thousands of data points and requires specialized chart types. Excel's charting capabilities can handle only a few hundred data points comfortably. Although it's possible to perform curve fitting (which draws a best-fit line through data points automatically) and other types of data analysis in Excel, you must write your own formulas into separate columns in your Excel spreadsheet. In most scientific-charting packages, curve-fits and transforms are available as menu choices that plot directly with your data.

Strictly Business

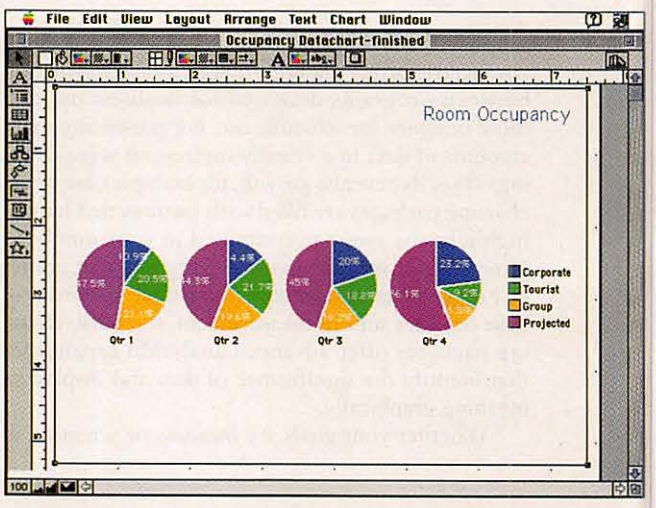
Business charting, as a rule, involves much smaller and simpler data sets than scientific charting. It's rare to see as many as 40 data points in a business chart, while a science graph often has thousands of data points. Besides simply presenting data that shows, for example, sales projections, business charts should keep an audience interested. For that reason, business-charting software often contains sound effects or flashy graphics. Scientific charting is designed to focus on presenting data in the most accurate way, typically in black-and-white, two-dimensional formats that meet the publishing constraints of many scientific journals. Business charts call for color, shading, and extensive use of 3-D and pseudo–3-D formats; users often want to create slide shows rather than printed charts.

Astound 1.02 from Gold Disk ($399, 408/982-0200, 800/988-9888) is a good example of the dazzle-the-audience approach to business charting. It offers an adequate assortment of chart types (including 3-D versions of most charts), but it also provides in-chart animated figures, sound, and QuickTime movies. Gold Disk assumes that charts are typically going to be part of a slide show, so Astound offers different styles of slide-to-slide transition (fades, wipes, and other mock-cinematic devices, including sound effects). The user chooses the show's presentation style, which sets shadings, borders, bullets, headlines, and outlining.

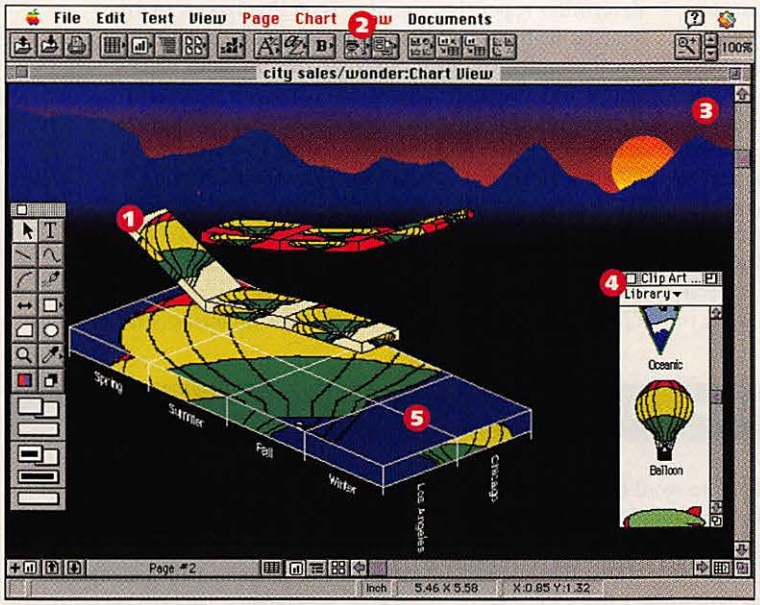
In conventional charting packages, which are based on the idea that a slide show should pretty much resemble an annual report or diagrams from a business textbook, text and graphs are static. Astound, in contrast, allows text to float in from the sides of the screen or materialize from sparkling powder; chart elements can grow in sequence before the viewers' eyes. This is a long way from the plain black-and-white line charts that have been the foundation of business graphing since the time of Adam Smith's *Wealth of Nations* in the eighteenth century. Astound brings the excitement of multimedia to presentation software; this may be necessary to hold the attention of today's audiences (see "It's Alive").

While Astound takes an MTV approach to presentations, Computer Associates International's Cricket Graph III 1.5 ($129, 516/342-5224, 800/225-5224) offers no sound, no QuickTime movies, no animation, and a limited assortment of backgrounds and shading options; you'll find most of the fancy stuff in the company's Cricket Presents ($199) instead.

Cricket Graph is designed to produce business charts, and it does provide graphs that are aesthetically more pleasing than standard Excel charts, while requiring almost no training. Longtime Cricket Graph users claim that if you create charts infrequently, this relative lack of features (compared with Persuasion, for example) makes Cricket Graph easy to relearn. Fans of Cricket Graph also point out that if you will be distributing charts in print in black-and-white, most of the special effects in snazzier business-charting packages lose their impact anyway. If you're creating charts on the road using a PowerBook, Cricket Graph's compact size (less than a 1MB of hard drive space) is an asset.



New Chart Tricks ClarisImpact has built in many variations on the basic business-chart styles. If you don't like these Modern pies (*modern* means labeled here), you can switch instantly to one of many variants.



DeltaGraph Pro

1 Business programs typically allow for a great variety of chart elements, some of which add confusion. **2** Most business-charting programs are organized around a slide-show format and make it easy to import sound and QuickTime movies. **3** Evocative backgrounds (often provided as templates) make a consistent tone in a chart presentation. **4** Business charts usually feature clip art, if only the company logo. **5** Where are axes? A science chart wouldn't allow this, but business charts often show data floating in space.

Imaginative Business Graphs

ClarisImpact 1.0 ($399, Claris Corporation, 408/727-8227, 800/544-8554), the newest business-charting package for the Macintosh, represents an intriguing mix of features. Claris set out to accommodate every sort of picture used in business communication. Besides charting, Impact does organization charts, Gantt-style time lines, calendars, flowcharts, and fancy tables.

Although ClarisImpact at first appears to offer a limited chart repertoire similar to Cricket Graph's, the basic data-charting facilities all have imaginative variations. So while you can of course call up a plain pie chart (called Trad Pie in the list of Impact choices), you can also try the flashier International Pie or Modern Pie instead (see "New Chart Tricks"). In short, every chart type in Impact's basic gallery is equipped with options to enhance its visual appeal. You can add shadows to simple line charts for emphasis, mix stacks of different objects in pictograms, and add titles at rakish angles for all sorts of chart elements.

Best of Both Charting Worlds

Astound, Cricket Graph, and ClarisImpact are designed for business graphs and don't delve significantly into scientific charting. DeltaPoint's DeltaGraph Pro 3 3.0.4 ($195, 408/648-4000, 800/446-6955), however, is a serious attempt to incorporate everything you could want in a single program, whether you're creating business or science charts. Generally, DeltaGraph Pro 3 succeeds.

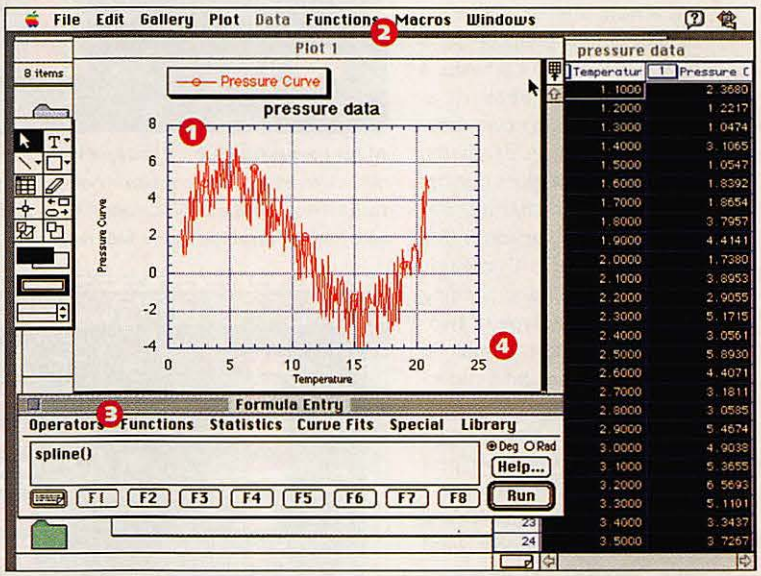
DeltaGraph has a variety of chart types ranging from basic business (bar, line, column, pie, scatterplot), to fancy variants of those charts, to specialized scientific types (polar, XY vector, and so on). And you can select these from a dialog box that shows thumbnails of each type. It offers Smart Layouts, analogous to Persuasion's AutoTemplates, which minimize your effort and promote consistency in your presentations. It incorporates clip art, Pantone-selected color palettes, and QuickTime movies; DeltaGraph also opens Excel files directly. Finally, DeltaGraph supports AppleScript, so advanced users can write short AppleScript programs that, for example, open every data file in a folder and make identically formatted graphs for each file.

What makes DeltaGraph unique, however, is that it combines snazzy designer effects with math capabilities equivalent to those in the science-oriented programs. Although business users might never get around to adding error bars to data or fitting a sales curve with a spline, and engineers probably won't put clip-art palm trees in the background of XY scatterplots, DeltaGraph puts these capabilities and more just a mouse-click away.

Make a Science of Charting

Deciding which scientific-charting package to buy would be a lot easier if one program stood out from the others. However, there is no product you can quickly dismiss because it has a short feature list or an unfriendly interface. And while the programs all create many of the same charts, they are also quite specialized. Each program was developed by scientists whose particular background shows in the software.

SigmaPlot for the Macintosh 4.14 ($295, Jandel Scientific, 415/453-6700, 800/874-1888), for example, is produced by a company whose main product line is statistics software. As you'd expect, SigmaPlot



KaleidaGraph

1 Science charts often show thousands of data points, not just a handful of sales figures. **2** Macros or a full programming language are typical of science charting software. **3** Science charting software supports a wide range of data-manipulation options. **4** Science charts are usually black-and-white. Even now, very few science journals—the eventual home for most science charts—publish in color.

is especially competent at plotting statistical data sets. With its roots in analysis of the kinds of data sets that appear in population biology, biophysics, and chemical kinetics, the product is ideally suited to producing charts for scientific reference journals. This means uncluttered black-and-white graphs with an emphasis on curve fitting and data statistics designed to match scientific-journal chart-format requirements.

Produced by a company called WaveMetrics, Igor Pro 2.0 ($495, 503/620-3001) has, as you'd expect, the best set of tools for analyzing waveforms (typically, plots of time versus voltage, which are used to determine repetitive signals). Igor Pro has so many analysis features that it could be described as an electrical engineering program that also includes black-and-white charting. Besides FFT (fast Fourier transform) functions, Igor's macro language supports statistics, peak fitting, and integration in spectroscopic/chromatographic data (see "Advanced Charting").

In contrast to most charting packages, in which the capability to open Excel files is considered a luxury, Igor Pro supports not just Excel files but also direct data acquisition from National Instruments' GPIB boards. Although with enough tinkering with

MAKE A SPLASH WITH YOUR GRAPHS

When it comes to presenting information effectively and attractively, Persuasion ($495, Aldus Corporation, 206/628-2320) and Microsoft PowerPoint ($395, Microsoft Corporation, 206/882-8080, 800/426-9400) control the lion's share of the Macintosh business-presentation market (see "Presentation Software That Delivers," *Macworld*, July 1994). Although they're not necessarily powerhouse charting engines like DeltaPoint's DeltaGraph Pro 3, they include strong chart repertoires embedded in a slick presentation environment.

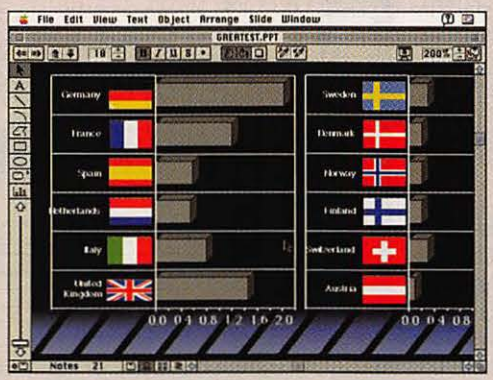
Persuasion Adds 3-D Charts Aldus's Persuasion has always offered a huge set of presentation templates, and now in version 3.0 it provides a large assortment of charts as well. If you consider every possible permutation of charts, Persuasion chart types number 80. The major charting enhancement to version 3.0 is the addition of 3-D variants (not just shading or adding depth) for every type of two-dimensional chart, combined with full rotation and perspective control.

With a little practice you can easily tinker with perspective and shade the appropriate data elements to either conceal trends that you don't want your audience to notice or draw attention to trends you don't want your audience to miss. You can hot-link data, presumably residing in a spreadsheet, to Persuasion charts using System 7's subscribe feature; in turn, you can hot-link charts to word processing documents with the publish feature. Persuasion lets you overlay multiple elements on a single chart page, so it's possible to create your own new chart types from Persuasion's repertoire.

The real strength of Persuasion, however, is that its AutoTemplates have preselected fonts, shading, titling, and other elements that will make you look like an experienced designer, while requiring little effort or skill on your part.



Aldus Persuasion 3.0 If you have lots of data to present, but lack an artistic flair, Persuasion's AutoTemplates make it a snap to create attractive and consistent slides. And version 3.0 adds true 3-D capabilities and a wide range of chart types.



Microsoft PowerPoint Version 4 promises 100 chart types as well as some features, such as curve fitting and error bars, that are usually found in scientific-charting programs. The new version will also include a Wizard that makes it easy to automate presentations to suit a particular task or meeting.

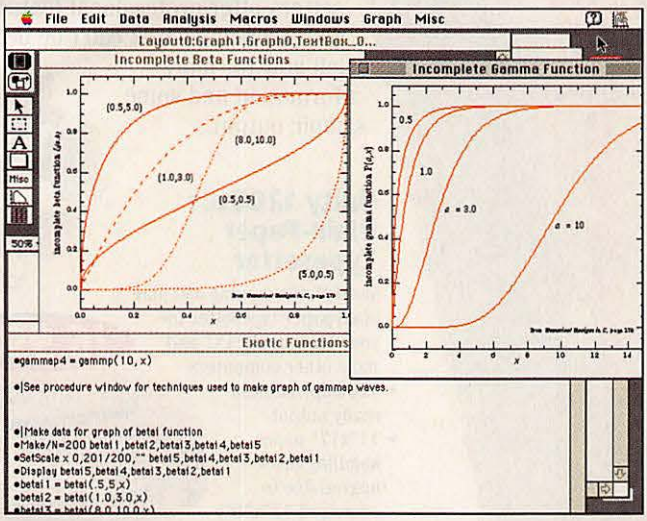
PowerPoint Hits 100 Graphs Microsoft PowerPoint is evolving according to Microsoft's standard strategy: look over the feature set in your biggest competitor and find a way to integrate those features into Microsoft Office, a suite of applications that includes Word, Excel, PowerPoint, and Mail. PowerPoint version 3.0 was shipping as this was written, but since version 4 for Windows had already been introduced, it's clear what features the Mac version of PowerPoint will have by midsummer. Version 4 for Windows adds several new chart types, including surface plots, radar charts, and doughnut plots (a kind of 3-D radar chart). For comparison with Persuasion, Microsoft counts 100 chart types in PowerPoint, although some of these are minor variants of each other. PowerPoint supports full rotation of its 3-D charts; as with Persuasion, you can be disarmingly honest or you can slyly fudge the way you present your data.

Features typically found in scientific-charting programs are now also available in PowerPoint. For example, PowerPoint offers curve fitting, error bars on chart data points, and computation of trend lines through data. The main improvement in PowerPoint, however, is the AutoContent Wizard's automation of common presentation tasks (sales meetings, quarterly reports, and so on). You just pick a type and add a bit of content. Similarly, the Pick A Look Wizard offers a set of template formats to apply for presentation consistency. A new drill-down feature lets you call up hot-linked documents in other Microsoft applications during a computer-based presentation, so that you can marshal supporting details for an argument on the spot in response to questions.

color features and chart elements you could make an Igor plot look like a DeltaGraph business chart, the graphical and operational macro capabilities in Igor target the program clearly at advanced scientific users who aren't put off by programming.

Charting the Really Big Numbers

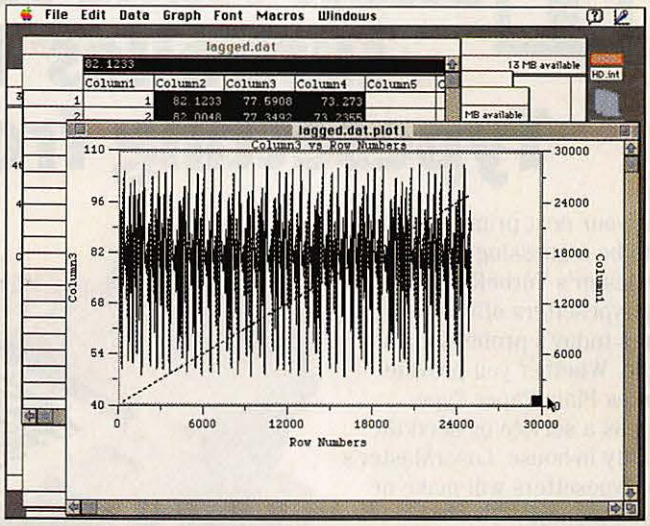
Spyglass Plot 1.0 ($295, Spyglass, 217/355-6000) is specialized for a unique function: charting very large data sets (see "Make Your Point"). It doesn't offer a large variety of chart types, but it can handle data sets of 32,000 columns by any number of rows, limited only by memory. Spyglass Plot chews up data quantities that the other scientific-charting programs simply choke on. (In business charting, 256 columns by a few thousand rows is considered a huge data set.) These monstrous data sets are stored in files in the supercomputer format called HDF (Hierarchical Data Format), and Plot reads these files directly. Spyglass Plot doesn't do 3-D: the company assumes you'll do your 3-D color contour plotting in its companion product Spyglass Dicer 2.01 ($695) and that you are using Plot for an XY view of data only.



Advanced Charting Igor Pro incorporates a powerful C-like programming language that extends Igor's analytical charting powers beyond the built-in functions of other programs.

KaleidaGraph 3.0 ($249, Synergy Software, 215/779-0522, 800/876-8376) is the most general-purpose scientific-charting program. It handles data sets of up to 256 columns by 32,000 rows, imports data directly from Excel, and offers sets-plotting templates. What sets KaleidaGraph apart is a particularly easy-to-use implementation of curve fitting—you can define a large set of possible functions for curve fitting, and then compare plots of these model functions with your original data on a single plot. While it's possible to do this by workarounds in the other scientific-charting programs, KaleidaGraph makes it easy.

For charting features combined with serious math capabilities such as FFTs, you have two choices: SuperAnalyst 1.9 ($249, SuperSoft, 801/225-4356, 800/827-4351) or Igor Pro. Of the two, SuperAnalyst is the simpler and less-expensive program that offers not only basic charts, drawing, and overlays, but also advanced computational functions, such as autocorrelation. SuperAnalyst goes beyond most competitors in its Function and Analysis menus, which include a variety of styles of numerical integration, differentiation, and root-finding for functions obtained from original data sets by SuperAnalyst's built-in smoothing routines (moving and polynomial averages, and three kinds of splines, for example).



Make Your Point That's 25,000 points, represented in this Spyglass Plot chart. Plot is useful mainly for two-dimensional views of the giant 3-D data sets handled by Spyglass Dicer and Transform.

Charting the Way

It's probably not surprising that charting programs encompass such a variety of features and target audiences, given that charts are the most common and effective way to communicate any type of numerical data. From the venture-capital slickness of ClarisImpact to the analytical artillery of Igor Pro, a wide range of charting products pick up where Excel leaves off. m

Macworld contributing editor CHARLES SEITER has reviewed most of the programs here, and consults with a variety of scientific firms on presentation design.

CHARTING SOFTWARE

MW EDITORS' CHOICE

Because there are a number of charting programs that excel at producing specific types of graphs, to make our Editors' Choice selection we focused on programs that handle a wide range of chart types—both business and scientific.

DeltaGraph Pro 3 3.0.4 For most charting purposes, it's hard to fault DeltaGraph Pro 3. The price is right, the feature set is huge, it's easy to use, and you can hot-link data from Excel. DeltaGraph Pro offers not only the most-wanted features for business programs but the key features for scientific charting as well. **Company:** DeltaPoint. **List price:** $195.

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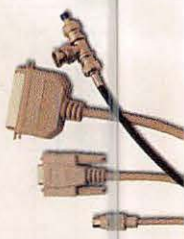
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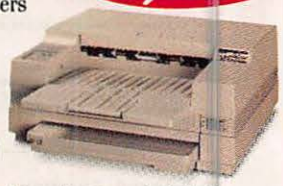
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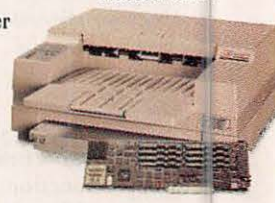
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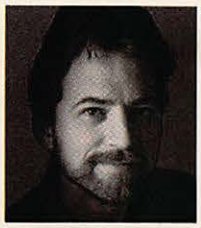
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BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

MICROSOFT WORD CAN CREATE TERRIFIC tables, but you cannot place them directly into Aldus PageMaker 5.0. Ken Kreshtool of Cambridge, Massachusetts, devised a workaround using the LaserWriter 8 printer driver, which PageMaker 5.0 requires. This latest generation of the LaserWriter driver lets you save your output as an EPS file, which is perfect for placing into PageMaker. Follow these steps:

1. In the Chooser, choose LaserWriter 8.

2. In your Word document, select (that is, highlight) the table.

3. In Word, choose the Print command. You want only the table saved as an EPS file, so in the first dialog box that appears, set the Destination option to File and check the Print Selection Only checkbox. Click the Save button, and in the next dialog box give a sensible name to the EPS file, choose Enhanced Preview (usually preferable to Standard Preview) from the Format pop-up menu, and adjust the other settings to taste (use balloon help for guidance). Click the Save button.

4. In PageMaker, use the Place command to place the table as you would any other graphic. The EPS graphic may fill the page on which you place it (Word doesn't always clip the EPS image properly), but you can crop and move it as necessary after placing it.

This approach has two advantages over using Word's Copy As Picture command. First, hairline rules print correctly instead of being converted to 1-point lines. Second, PageMaker remembers a link to the EPS file, so you can update your PageMaker table simply by editing the original in Word, saving it again as an EPS with the identical name as the previous EPS file, and updating the link in PageMaker. PageMaker even preserves all the cropping and moving you did after placing the first edition of the table in PageMaker.

Note: LaserWriter 8.0, which comes in the box with PageMaker 5.0, is buggy, although it seems to work fine for this purpose. The current version, LaserWriter 8.1.1, fixes bugs and improves functionality. It is available from online services and is included with Aldus's Macintosh Filter/Driver Pack Plus, which also upgrades PageMaker 5.0 to version 5.0a ($9.95 from Aldus, 206/628-2320).



DON BAKER

Gradient Trapping Update

The procedure presented in a sidebar in last June's *Quick Tips* for trapping a gradient-filled object in Illustrator 5.0 and 5.1 is missing one important step. Although you can set the gradient-filled trap to overprint, the gradient fill does not overprint correctly, reports Bob Faulkner of Venice, California. The workaround is to save a copy of the finished illustration in Illustrator 3.0 format, and separate the 3.0 version with Adobe Separator, or place the 3.0 version in a page-layout program and separate it there. (Keep the original Illustrator 5.0 or 5.1 version in case you need to change it later.) Saving in Illustrator 3.0 format converts the gradient fill into an object blend (a series of paths), which overprints correctly. Alternatively, you can manually create a blend with the blend tool in Illustrator 5.0 or 5.1 (the same process works in FreeHand). Illustrator 5.5 includes a filter that automatically performs trapping, but the filter does not work with gradients; so the manual workaround still applies.

Hard Drivers

Q. Please tell me if anyone sells driver software for hard drives that takes advantage of SCSI Manager 4.3 found in the 660AV, 840AV, and all Power Macs.

David A. Brown
Saratoga, California

A. Eight companies I contacted said their latest drivers take full advantage of SCSI Manager 4.3. The hard drive utility applications that install 4.3-compliant drivers range from the no-frills $49.95 FormatterOne Pro 1.0 (Software Architects, 206/487-0122) to the full-featured $199 Hard Disk Toolkit 1.5 (FWB, 415/474-8055). For a comparison of those and eight other hard drive utilities whose latest versions can install 4.3-compliant drivers, see "Hard-Drive Optimizers," *Macworld*, March 1994. Of the companies listed there, Bering Industries says it is withdrawing from the Macintosh hard drive–utility market, and Golden Triangle did not return my calls.

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SCSI Manager 4.3 is the latest version of the part of the operating system that controls data transfer between a Mac and its SCSI devices. Theoretically, Apple could use a system extension to add SCSI Manager 4.3 to all Centris and Quadra models, but so far it has not done so.

The performance improvement you experience after switching to a 4.3-compliant driver could be anywhere from 0 to 30 percent, depending on many factors, including the following:

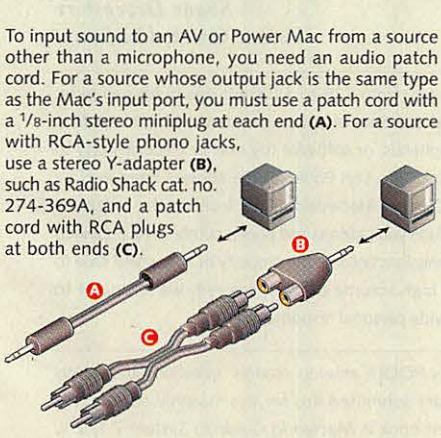
- The type of drive or drives you use
- How much data your applications transfer at a time (for example, opening and saving small word processing or spreadsheet documents will show less improvement than opening and saving color images and multimedia files)
- The relative quality of the software engineering in the old and new drivers
- Cable quality (it is possible for poorly shielded cables to degrade performance by 500K per second)

Sound-Input Cable

Q Realizing I needed a patch cord to connect my Quadra 840AV to my sound synthesizer, I examined the stereo plug on the Apple speech-recognition microphone that came with the computer. I was surprised to learn that it is nonstandard, and I'm unable to find one like it or even get information about it from Apple. Short of cutting the plug off my Apple microphone, how am I to obtain a patch cord?

David McDonald
Koloa, Hawaii

A Although the Apple speech-recognition microphone has a nonstandard plug, you can use an ordinary patch cord to connect an audio source to the audio-input port of a 660AV, 840AV, or any Power Mac. The mike's extralong plug reaches deep inside the sound-input port to draw power for the mike's internal preamplifier. A patch cord doesn't need electricity, so its regular ⅛-inch stereo miniplug need not reach the port's power lead.



To input sound to an AV or Power Mac from a source other than a microphone, you need an audio patch cord. For a source whose output jack is the same type as the Mac's input port, you must use a patch cord with a ⅛-inch stereo miniplug at each end **(A)**. For a source with RCA-style phono jacks, use a stereo Y-adapter **(B)**, such as Radio Shack cat. no. 274-369A, and a patch cord with RCA plugs at both ends **(C)**.

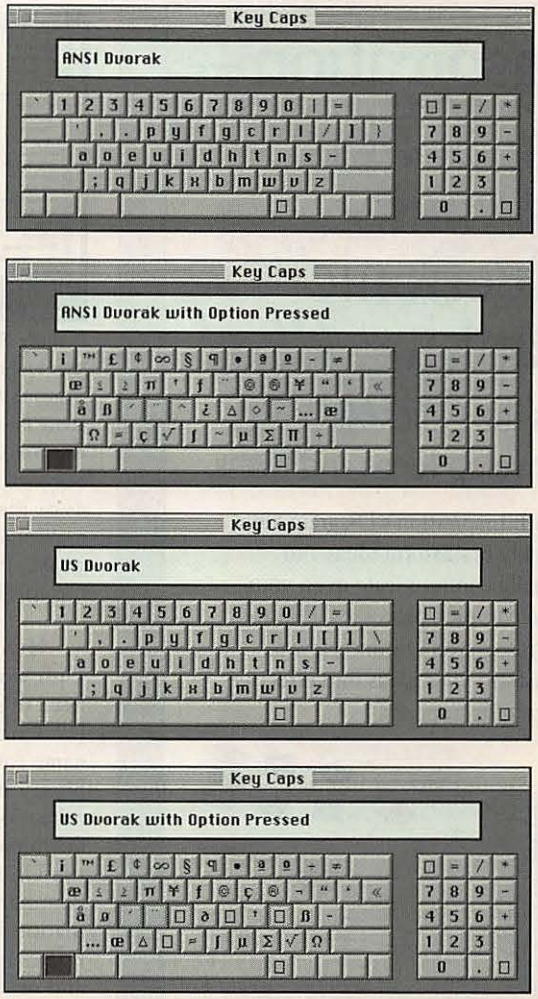
Dvorak Keyboard Layout

Q Where can I obtain software that will convert my keyboard to the Dvorak system through the Keyboard control panel?

Sara Neyer
Gillette, Wyoming

A America Online and CompuServe both have several Dvorak keyboard-layout files, and so do user groups such as BMUG (510/549-2684). All layouts adhere to the Dvorak layout for letters but put punctuation, symbols, and diacriticals in different places (see "Dvorak Variations"). Detailed reasons for the differences accompany each free keyboard layout. You install a keyboard layout by dragging it to the System Folder.

In addition to switching keyboard layouts with the Keyboard control panel, you can use System 7's Keyboard menu, which is normally hidden. To make it appear between the Application and Help menus, use ResEdit to turn on the "Always show kybd. icon" option in the System file's itlc resource.



Dvorak Variations A number of Dvorak keyboard layouts are available from online services and user groups. These versions differ in the location of punctuation, symbols, and diacriticals. Shown here are the ANSI Dvorak and US Dvorak layouts.

Express Modem Problems

Q I have heard the Apple Express Modem has problems, but I have yet to hear precisely what is wrong with it. The one in my Duo 230 fails miserably at high-speed file transfers using the Zmodem protocol. Is the Express Modem to blame? If not, what causes the problems, and can they be fixed or am I stuck with a lemon? To the best of my knowledge, I have the latest software for my modem.

Aaron Hathaway
Santa Fe Springs, California

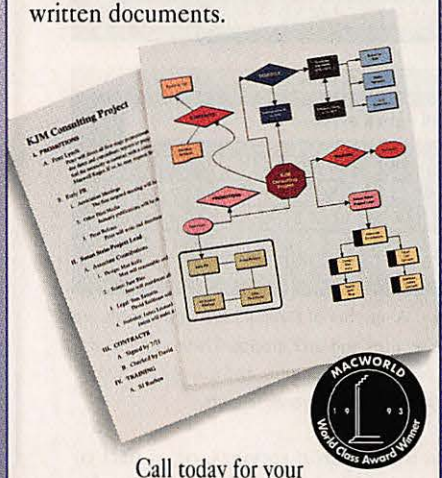
A The Express Modem had a variety of problems initially (too numerous to list here), but the many sources I contacted agreed that version 1.1.2 of the software makes the Express Modem as reliable as any modem. That version was released last year for PowerBooks as well as 660AV and 840AV Macs and is available from Apple dealers and online information services, or as part of the System Update 2.0.1 disk from the Apple Order Center ($10, 800/769-2775, ext. 6717). (The Power Macs also use Express Modem software, and come with version 1.5.1.)

Your problem may be one that could afflict any type of modem. Maybe you need to change your communications program's modem-initialization string or its settings for Zmodem transfer. Get specific advice from the publisher of each communications program you use. For example, Software Ventures advises Express Modem owners to use the latest versions of its communications applications, MicroPhone II 5.0 and MicroPhone Pro 2.01. Where previous MicroPhone versions used a generic initialization string (which Software Ventures calls a driver) with the Express Modem, the latest MicroPhone versions have a special initialization string for the Express Modem (and individualized strings for other modems).

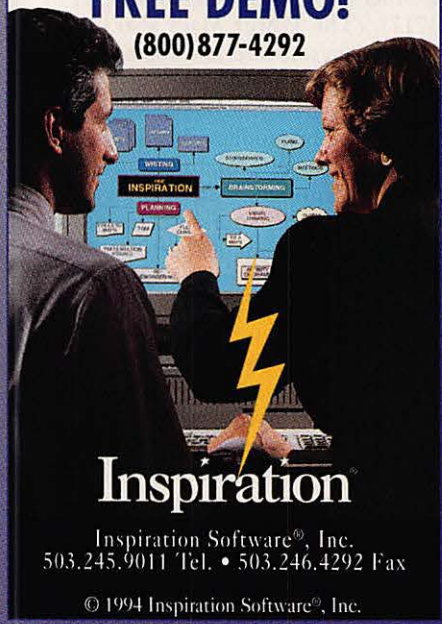
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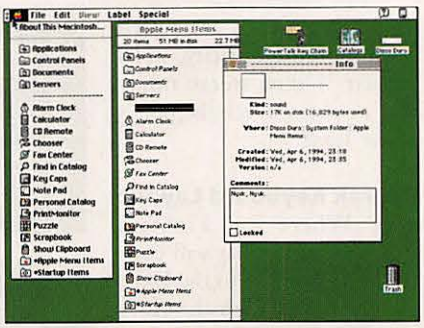


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Orderly Finder Window You can easily force an item to the top of a Finder window without visibly changing the item's name, like the items shown here above the divider line in the Apple Menu Items window. You paste a blank line (not a blank space) at the beginning of the item's name. (Incidentally, the divider line is a sound file whose name is a string of hyphens and whose custom icon is a blank white graphic. The Show Clipboard item is an alias of the Clipboard file in the System Folder.)

If you're downloading files from a Unix workstation or mainframe, you may need to specify certain options along with the Unix file name. Try **sz -w 2048 filename** for text files and **sz -e filename** for binary files (replacing **filename** with the name of the Unix file you want to download). If you're having trouble with the Unix telnet command, try the **rlogin** command, and vice versa. (This information is based on the ZTerm 0.9 FAQ by Les Jones, available on America Online and on the Internet through the comp.sys.mac.comm and comp.sys.mac.apps Usenet newsgroups.)

Also, don't overlook the possibility that the problem may lie with the modem or communications program to which you are connecting.

Forcing Order Invisibly

TIP Forcibly reordering items viewed by name in a Finder window by putting spaces or punctuation marks at the beginning of the items' names gets up my nose. It visibly pollutes the names and conspicuously messes up name alignment. Here's how to invisibly force the order you want, as illustrated in "Orderly Finder Window."

Open the Note Pad or a new document in TeachText or any word processor. Press the return key to create a blank line, select the blank line, and copy it to the Clipboard. Switch to the Finder, click the name of an item you want to appear at the top of its folder, press the up arrow key to move the insertion point to the beginning of the selected name, and paste. The whole name will go blank, but don't fret. Press the enter key or click outside the name, and the name will spring back into view. The renamed item will jump to the top of the window if you're viewing by name. To increase an item's alphabetic buoyancy, paste the blank line two or more times at the beginning of the item's name.

Chris Bloomfield
Kelburn, Wellington, New Zealand

Finding Nothing in ClarisWorks

TIP There is a way in ClarisWorks databases to find all records where a certain field is blank (or not blank). Use the Find command to create a find request, select the field of interest, and enter **<>""** to find all records within the field that are not blank. Making the same entry and checking the Omit checkbox finds records where the field is blank.

Charles L. Stang
Milwaukee, Wisconsin

Self-Updating Field Names

TIP When you are working with Microsoft Excel's database commands and functions, such as Find and Extract, the field names (column titles) must be exactly the same in the database range, the criteria range, and the extract range. The most obvious way to assure this is to copy the field names from the top of the database range, to the criteria and extract ranges. However, the database commands and functions will not work if someone later changes a field name in the database and neglects to recopy it to the criteria and extract ranges. Even if you always remember to recopy changed field names, another person using your spreadsheet may forget or be unaware of the potential problem.

To avoid this pitfall, simply use formulas at the top of the criteria and extract ranges. The formulas reference the field names in the database range. For example, suppose the name of the first field in your database range is in cell A2. If the name of the same field in the extract range is in cell F2, enter the formula **=A2** in cell F2. Now any changes to the field name in A2 will automatically update cell F2.

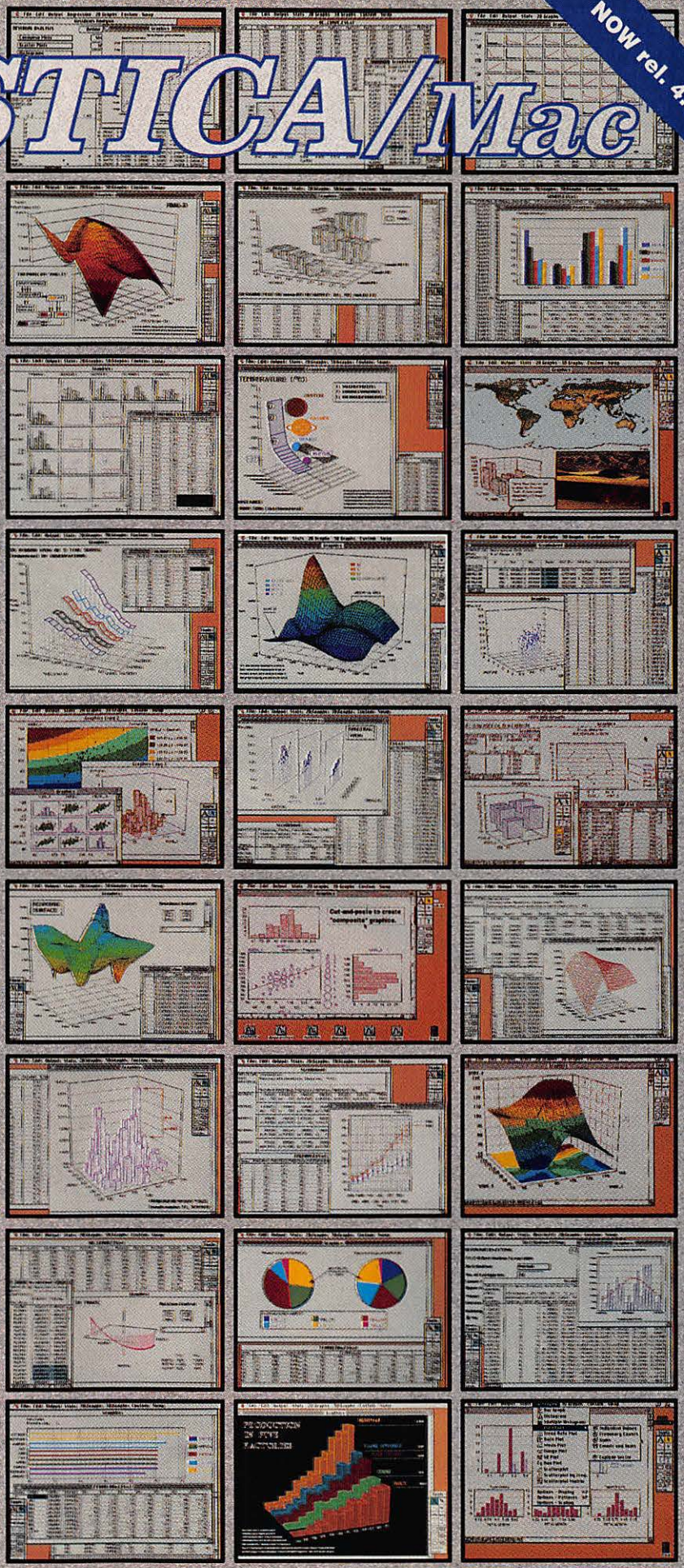
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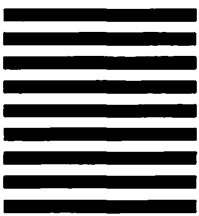
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Networks

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PowerPC Server Applications Arrive



JEFF BRICE

POWER MAC SOFTWARE publishers are announcing applications for the PowerPC-based Workgroup Servers that can run many times faster on the Workgroup Servers than on any 680X0 Mac server, but they've only scratched the surface of the application possibilities.

Network application updates accompanied last month's Workgroup Server announcements, with publishers claiming big speed gains (see *Networks* news, July 1994). For instance, Dantz Development's Retrospect Remote 2.1, which comes bundled with the WS 8150 and 9150, operates up to five times faster than its predecessor. Aldus's Color Central 2.1 (due by summer), an Open Prepress Interface and printer server application, performs two to four times faster under PowerPC. And Aldus's TrapWise 2.0 will operate at three to eight times the speed of the trapping application running on a 680X0 Mac. In the world of databases, Canto's Cumulus PowerLite 1.2 ($199) and Cumulus PowerPro (five users $1495) both offer a 200 to 300 percent speed boost over previous versions of those database managers; and EveryWare Development's Butler 1.3 ($1695; due in July) will bring users three to four times the speed of 680X0 Mac versions.

The performance gains sound impressive, but the truth is that the full potential of the new Workgroup Servers for server-based and client/server applications remains a mystery to developers. For example, Dantz discovered that Retrospect Remote 2.1 runs faster using compression and encryption than it does nonencrypted and noncompressed. So far nobody knows why.

Because developers are still learning the ropes, it's hard to pinpoint categories of applications likely to benefit from PowerPC's qualities. One thing is clear: if an application relies heavily on the AppleTalk protocol stack or other Mac OS–based networking capabilities, such as AppleShare or Apple File Sharing, don't expect much of a speed boost until Apple converts its AppleTalk protocol stack to run in native PowerPC code instead of in 68040 emulation. One product that won't have to wait for Apple's conversion is ACI US's 4D Server Universal 1.0, due this summer. 4D relies on the company's own implementation of AppleTalk, and ACI US has already rewritten it in native PowerPC code.

The direct memory access (DMA), instruction caching, and RAM caching that are possible with the PowerPC, speed AppleTalk a little but not enough to overcome AppleTalk's fundamental speed limit. Apple acknowledges that the fastest networking applications will be based on other networking protocols, like TCP/IP or Novell's IPX, which boast much higher theoretical speed limits. (AppleTalk maxes out at 256 Kbps, while IPX and TCP/IP have proven themselves at much higher speeds.)

When developers and Apple have native software, the PowerPC could not only change the way existing applications are implemented, but also create new classes of networking applications that weren't possible under the power of the 68040. For instance, Aldus has announced Open Prepress Environment 1.0, a workflow manager for prepress applications slated to ship in the fall.

ACI US, 408/252-4444; Aldus, 206/622-5500; Canto, 415/431-6871; Dantz, 510/253-3000; EveryWare, 905/819-1173.—MARGIE WYLIE

Two for Networked Faxing

TWO RECENTLY INTRODUCED PRODucts allow users to share a modem for exchanging faxes. PSI's Faxnetwork server software ($99) turns any Mac on the network into a nondedicated fax server for any Class 2 modem. Client Mac software ($225 for five users) sends fax jobs to the server where they are spooled, processed, and sent, quickly freeing client Macs for other uses. For convenience, the server can also print out all incoming faxes on arrival.

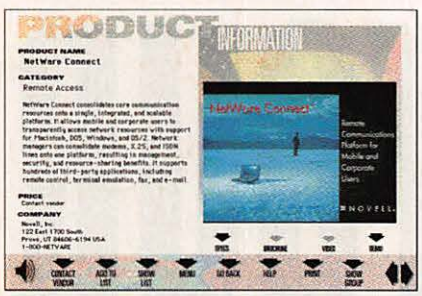
4-Sight's Small Site ($995 for ten users, including a Zoom VFX V.32bis modem) lets Macintosh users fax multiple documents simultaneously from an application you call up with a keyboard command. Processing and logging happen locally. LineShare Lite from Stalker Systems, which is bundled with Small Site, allows the modem to be shared between fax and data applications (such as ARA). PSI Direct, 408/559-8544, 800/622-1722; 4-Sight, 515/224-0211.

—MARGIE WYLIE

CD-ROM Network Guide

THE NETWORK SOLUTIONS GUIDE TO Mac network hardware, software, and services, once published by Apple Computer, is available from an offshoot of Pacific Bell in a new guise, as a CD-ROM. The first one's free, kids, until July 31. Thereafter it's $499 for four issues of the quarterly, called Re:Source Network Solutions. Each issue includes interactive articles, an extensive product-and-service database, collected spec sheets, and the option to order any listed product through an associated system integrator. Later this year look for an online version. Pacific Bell Information Services, 415/ 543-7593, 800/303-7247.

—NANCY E. DUNN



The Re:Source CD catalogs network products.



RICHARD RETHEMEYER

Cabletron's communications hub has room for up to 28 modems.

Modems Plug in to the Hub

CABLETRON SYSTEMS AND XYLOGICS have teamed up to develop a communications server that offers up to 28 high-speed modems and supports AppleTalk Remote Access Protocol (ARAP). Xylogics' Modmim, a $23,900 module that fits into Cabletron's multipurpose hubs, comes with 4 built-in V.32bis modems and room for up to 12 internal modems, which are priced separately. The remaining 4 serial ports can support up to 16 additional external modems, so you can use your existing inventory of modems or add new devices.

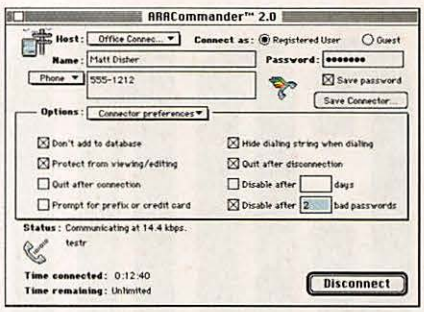
The Modmim's built-in ARAP support lets Macintosh users dial in using Apple's ARA client software version 1 or 2. The module also supports common Unix- and Intel-based PC protocols, including SLIP (serial-line Internet protocol) and PPP (point-to-point protocol). It can be managed via Simple Network Management Protocol, and it offers dial-back security. Cabletron Systems, 603/332-9400.—MARGIE WYLIE

ARA Made Easy

FOR ONLY A FEW BUCKS PER CLIENT, Apple Remote Access administrators can nurse the technologically hopeless and keep would-be intruders at bay while sharing the network's wealth with even temporary users.

Trilobyte Software's ARACommander 2.0 (1 user $35, 100 users $675) is a commercial upgrade of a respected shareware utility that adds a feature-rich, flexible, and secure interface to existing ARA client software (versions 1 and 2).

For users, the utility's control panel provides an easy way to automate dial-in times, application launch, and disconnection. Network administrators can use ARACommander 2.0 to create Connectors, small custom applications that execute log-ins. You can set up a Connector to dial a server automatically at scheduled times, launch applications, perform AppleScripts, and automatically disconnect after a specified idle time. Connectors also let administrators hide the network phone number, account name, and password from clients, as well as build in a self-destruct date. Connectors can disable themselves after several incorrect password attempts. Trilobyte Software, 513/777-6641.—MARGIE WYLIE



ARACommander automates ARA connections.

IN BRIEF

■ **For Sun Servers** Updated uShare 4.0 server software, which makes Sun Microsystems servers look and act familiar to Mac users, offers improved performance, supports AFP 2.1, and includes Mac-based administration. Built-in application mapping allows assigning double-clickable Mac icons to Unix and MS-DOS documents. Version 4.0 ranges from $595 for one user to $1395 for any number of Mac clients ($295 for upgrades). Information Presentation Technologies, 805/541-3000.

■ **eNote for the Mac** This summer E Ware Corporation plans to ship a Mac version of eNote, its Windows E-mail program, which displays a small, handy palette of buttons on the desktop for sending messages without pulling down a menu. About $200 for five users. 212/564-7791, 800/743-8645.

■ **X-Windows Update** An add-on module for White Pine Software's Mac 5.1 X-Windows client emulator, eXodus eXpress, lets eXodus users dial in to an X-Windows server at a speed that the company claims rivals Unix remote-access protocols, like SLIP and PPP. $99 per client module, plus $99 per module for each Unix host. Also due in late summer: eXodus for Power Macintosh ($259; $75 as an upgrade), a PowerPC native application. 603/886-9050.

BY MARTHA STRIZICH

Public online services offer low-cost ways to link far-flung offices

A decade ago, your company had to lease a private phone line to connect its mainframe computer with the terminals and computers at its branch offices. Branch employees probably used low-speed lines to access the mainframe at speeds of 9600 bps to 56 Kbps. The data processing center may have leased an entire T1 circuit that funneled the traffic flowing in from the branches to a single 1.54-Mbps pipeline.

Today, most businesses still use private-line wide area networks to send data between far-flung locations. The reason: private lines provide maximum control over network resources, a high level of data security, and unlimited usage at a fixed price.

But the corporate computing environment is changing. The terminal-to-host scenario is becoming a thing of the past. LANs are becoming the norm. And connecting several LANs into a single, enterprise-wide network is becoming mandatory for companies that do business at more than one location. Network managers face the challenge of finding cost-effective methods to integrate their LANs. Network managers now have an alternative to dedicated private lines: public data services.

Public data networks use their own network-based services and equipment to route your data traffic along with traffic from other customers over a shared network facility.

A smorgasbord of public data services with names like *frame relay* and *switched digital* are now offered by long-distance carriers such as AT&T (201/606-2000) and Sprint Corporation (404/859-5000), local carriers such as Bell Atlantic (215/963-6000) and Pacific Bell (415/542-9000), and value-added network providers such as CompuServe (614/457-8600) and Infonet Services Corporation (310/335-2600).

The key to choosing the right service is to understand the LAN applications your company plans to run over your WAN. Before you start shopping, you should consider the following.

- Your connectivity requirements. How many LAN locations are you connecting—two, three, or more? Does each location need to connect to each other location in an any-to-any configuration? Do you plan to install network connections with customers or suppliers outside your company? Do each of your branch locations need to connect only to your headquarters office, or does each branch need to connect to each other branch in an any-to-any (full-mesh) configuration?
- Your volume of usage. On average, do your users transmit small, medium, or large files across the network? How much time does it take to transmit a typical file?
- Your data-transmission frequency. Is network traffic constant or intermittent? Do users send and receive files over the network all day long or only occasionally?
- Your need for speed. Do users send large image files over the network that will choke at slow speeds? Do they send database queries that require rapid response times? Or are most users transferring small files and sending electronic mail?
- Your disaster-recovery needs (automatic rerouting). Is a portion of your network traffic mission-critical? Will your company's business suffer if a network connection fails and your data is not automatically rerouted? Are you paying extra for disaster-recovery services?

Now consult the table "Where Public Data Services Make Sense" to see which data services match up best with your company's WAN needs.

- If you already have a private network in place, you might want to consider adding frame-relay or switched-digital connections at your branch locations but leaving your backbone network intact.

CONNECT YOUR

• If you're sending files from your remote offices back to your main office just a few hours each day, a switched-digital service is an economical choice.

• If you plan to connect the LANs at, for example, each of your four offices into a one-to-any (mesh) network, a frame-relay solution is a good bet.

• Or, if your company needs to exchange information regularly with its customers, business partners, or suppliers, a TCP/IP network could be your solution.

To understand the applicability of each type of service, consider their strengths and weaknesses.



HANK OSUNA

LANs

Switched-digital services Switched-digital services (sometimes called *digital dial-up* services) typically cost less than private lines if your data traffic averages less than two hours per day and your sites are widely separated.

Switched services work like regular voice calls. To set up a switched call, you simply dial a predetermined phone number and start sending data. The beauty of this system is that you're charged only for the bandwidth you need, only when you need it. A typical switched 56/64 Kbps (commonly called just switched 56) call from New York to San Francisco will cost you between $7 and $10 per hour—the same as or slightly more than what a voice call costs.

Switched services are a natural for remote offices that can't justify a private line or for telecommuters whose bandwidth needs exceed the upper limits of analog modem connections. Switched services can also augment private-line connections during peak traffic times or dial backup bandwidth in case a private line goes down.

If you plan to interconnect LANs using switched-digital circuits, you'll need a router or an inverse multiplexer to connect to the WAN. Inverse multiplexers let users aggregate multiple switched 56 circuits into temporary high-speed pipelines. Instead of using individual 56 Kbps connections, for example, inverse multiplexers dial up as many as 24 56-Kbps circuits to bridge LANs or back up private lines.

If you are connecting individual Macs to switched services, you need to plug a Data Service Unit/Channel Service Unit (DSU/CSU) or an Integrated Services Digital Network (ISDN) terminal adapter into your machine.

Carriers offer switched services in bandwidths of 56, 64, 384, and 1536 Kbps. You can sign up for these services by calling either your local phone company or your long-distance carrier. But check prices carefully; in some cases you may find it cheaper to use your local phone company's switched service to connect to your long-distance carrier than it is to sign up for switched services directly from your long-distance carrier.

Frame-relay networks Frame-relay services and LAN internetworking are considered by some people to be a match made in heaven. That's because frame relay, an updated version of X.25 packet switching, economically connects multiple sites in an any-to-any configuration and efficiently handles the high-burst data transfers that are typical of LAN traffic, imaging, and client/server exchange. Typical uses include financial data trans-

fer, CAD/CAM imaging, and forms processing. Frame-relay networks are also a good choice for critical applications because they automatically reroute data in case of network failure.

Frame relay works by breaking data streams into packets and then routing the packets to their network destinations over logical connections called *permanent virtual circuits* (PVCs). A company must set up PVCs between its different network locations before any one location can send or receive data from any other location. Requiring that a company predefine PVCs between locations before any communication can take place is what makes the data on your public frame-relay network just as secure as the data on your private-line network.

PVCs also make frame-relay networks cheaper to use than private lines for internetworking three or more LANs. That's because a single physical connection into a frame-relay network supports multiple logical connections into the network. A company connecting five locations into an any-to-any frame-relay network, for example, pays for one connection into the network for each of its five locations, for a total of five connections. A company connecting the same five locations into a private-line network, on the other hand, must pay for ten network connections, since each logical connection on a private-line network requires a physical connection as well.

To get started with frame relay, you need frame-relay-capable routers. Major vendors sell routers that support frame relay and AppleTalk protocols. Some companies report that using a frame-relay network costs 20 to 30 percent less than using a private-line network—enough to pay for the investment in routers during the network's first year of operation. Carriers such as AT&T, CompuServe, and WilTel (918/588-3210) offer frame-relay services at connection speeds ranging from 56 Kbps up to T1.

X.25 networks Frame relay's predecessor, X.25, is a low-speed packet-switching technology that is still widely used today for interactive, transaction-oriented applications such as order entry and credit card verification. Because of X.25's large network overhead, most X.25 networks operate at top speeds of 56 Kbps—too slow to effectively handle LAN-to-LAN traffic.

But don't rule out X.25 networks if you just plan to send electronic-mail messages and small files across wide area links. Companies like AT&T and Sprint use worldwide X.25 networks to provision their AT&T Mail and SprintMail global electronic-messaging services.

Where Public Data Services Make Sense

	Frame Relay	Private Line	Switched Digital	TCP/IP	X.25
Connectivity					
One-to-one	○	●	●	○	○
One-to-any	●	○	●	●	●
Any-to-any	●	○	○	●	●
Traffic volume					
Low	●	○	○	●	●
Medium	●	○	●	●	○
High	○	●	●	○	○
Traffic frequency					
Occasional	●	○	●	●	●
Frequent	●	●	○	●	●
Speed					
Low	○	●	○	●	●
Medium	●	●	●	●	○
High	●	●	●	●	○
Automatic rerouting	●	○	○	●	●

● = *appropriate use of this service;* ○ = *inappropriate use of this service.*

Also consider X.25 if you communicate with offices overseas. Its error-checking protocols make it effective in areas of the world where circuits are noisy and transmission errors are likely to occur.

TCP/IP services Recently, service providers like Advanced Network & Services (914/789-5300), Infonet, and Sprint have started offering managed TCP/IP-based routers that let companies connect their LANs to their customers' or suppliers' LANs or build customized TCP/IP networks via the public Internet.

The advantages of TCP/IP include the ability to connect dispersed LANs across diverse networking environments and to provide access to the resources of the global Internet. (For more information, see "Linking AppleTalk Workgroups over TCP/IP," *Macworld*, April 1994.) Most likely to benefit are companies that need to transfer files or exchange E-mail with their suppliers, customers, or trading partners across the country or around the world, since the TCP/IP communications protocol lets users easily connect incompatible E-mail systems and LAN protocols across wide area links.

Their disadvantages include concerns that subscribers on the public Internet could gain access to an organization's private network resources. Managed services tackle the security issue head on. Designed for companies that have no interest in the public Internet but want LAN-to-LAN TCP/IP connectivity, these services set up virtual private networks for companies by restricting users' access to all but certain predefined network locations.

Consider the offerings of the different Internet service providers carefully if you're thinking of using TCP/IP as your WAN transport system. Offerings and fee structures vary between providers.

Choosing a Provider

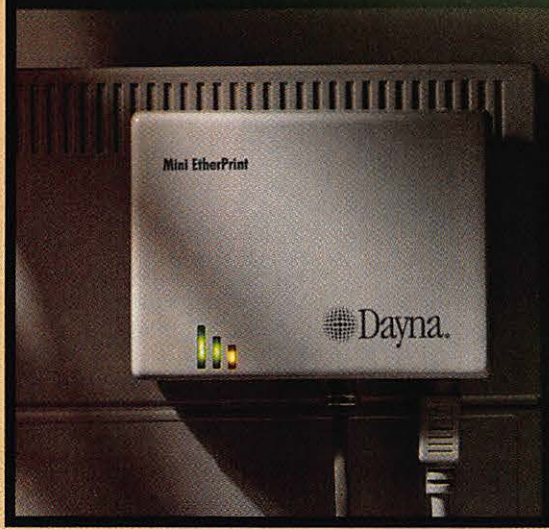
Once you have homed in on the data service that suits your LAN applications, it's time to look for a service provider. It's also time to decide how much control you need—or can provide—over your WAN links. Do you have the staff and the budget to manage your own network, or will it be more economical for you to pay a service provider to manage your network?

For a fee, most service providers will completely take over the design and implementation of your network, including arranging for access lines from the local phone company and installing the equipment you need at each of your network locations. Once your network is operational, you can sign up for round-the-clock, seven-days-a-week network monitoring and management services.

For example, Sprint recently started offering managed network services for its SprintNet (X.25), SprintLink (TCP/IP), and Frame Relay Services. Depending on the complexity of your router setup, Sprint will design and implement your network for a onetime fee ranging from $250 to $1000 per network node. Ongoing service charges include on-site router-maintenance fees of between $40 and $150 per month and router-management services of $240 per month, per router. The company has said it plans to offer managed network services for its private-line and switched-digital services by year's end. (Other companies offer similar services at similar rates.) **m**

MARTHA STRIZICH writes frequently about networking.

Connecting LocalTalk Devices To Your Ethernet Is A Big Deal.



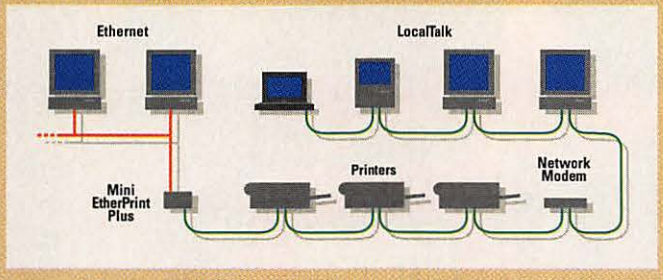
Your Connector Doesn't Have To Be.

No Boundaries
NO LIMITS

Introducing Mini EtherPrint™. Up To 8 LocalTalk Connections, New Compact Size.

Connecting LocalTalk printers and other devices to Ethernet has never been easier or less intrusive. The reason? Dayna, the very company that pioneered the technology with EtherPrint™, has made a small improvement that promises big benefits.

It's called Mini EtherPrint, and it's the ideal way to provide a simplified Ethernet connection for as few as 1 or 2 LocalTalk printers to as many as 8 LocalTalk devices of any variety.



Mini EtherPrint products are ultracompact plug-and-print solutions offering Ethernet connectivity for LocalTalk devices. Mini EtherPrint supports 1 or 2 devices, Mini EtherPrint Plus supports up to 8.

Mini EtherPrint connects to your printer with no set-up routines or start-up sequences. Just plug and print. For easy trouble-shooting, we've included power, activity and link status lights, as well as a handy reset switch. And if there's a power outage, Mini EtherPrint will restart and restore its connections automatically. We also include SecurIt™ protection software to prevent unauthorized access to network modems, color printers or other LocalTalk devices.

Mini EtherPrint may be the smallest connector around, but it offers the biggest cost advantages. A competitive price per connection, Lifetime Warranty and 24-Hour Replacement Program make our value especially tough to beat.

Prove to yourself that the challenge of connecting more LocalTalk devices to your Ethernet is smaller than you thought. Choose Mini EtherPrint from Dayna. For more information, call 800-443-2962 ext. 538 or use our 24-hour FAX Response System.

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Circle 161 on reader service card

Okay, so what's on your Xircom Pocket EtherTalk Adapter?

Jill Byron
Account Executive

My PowerBook, which I take everywhere.

My LAN which I can finally get on!

Access to all the network applications that don't fit on my PowerBook.

E-mail thanking Sean for my Xircom Pocket EtherTalk Adapter.

My Syquest and CD ROM drives daisy-chained on my SCSI port.

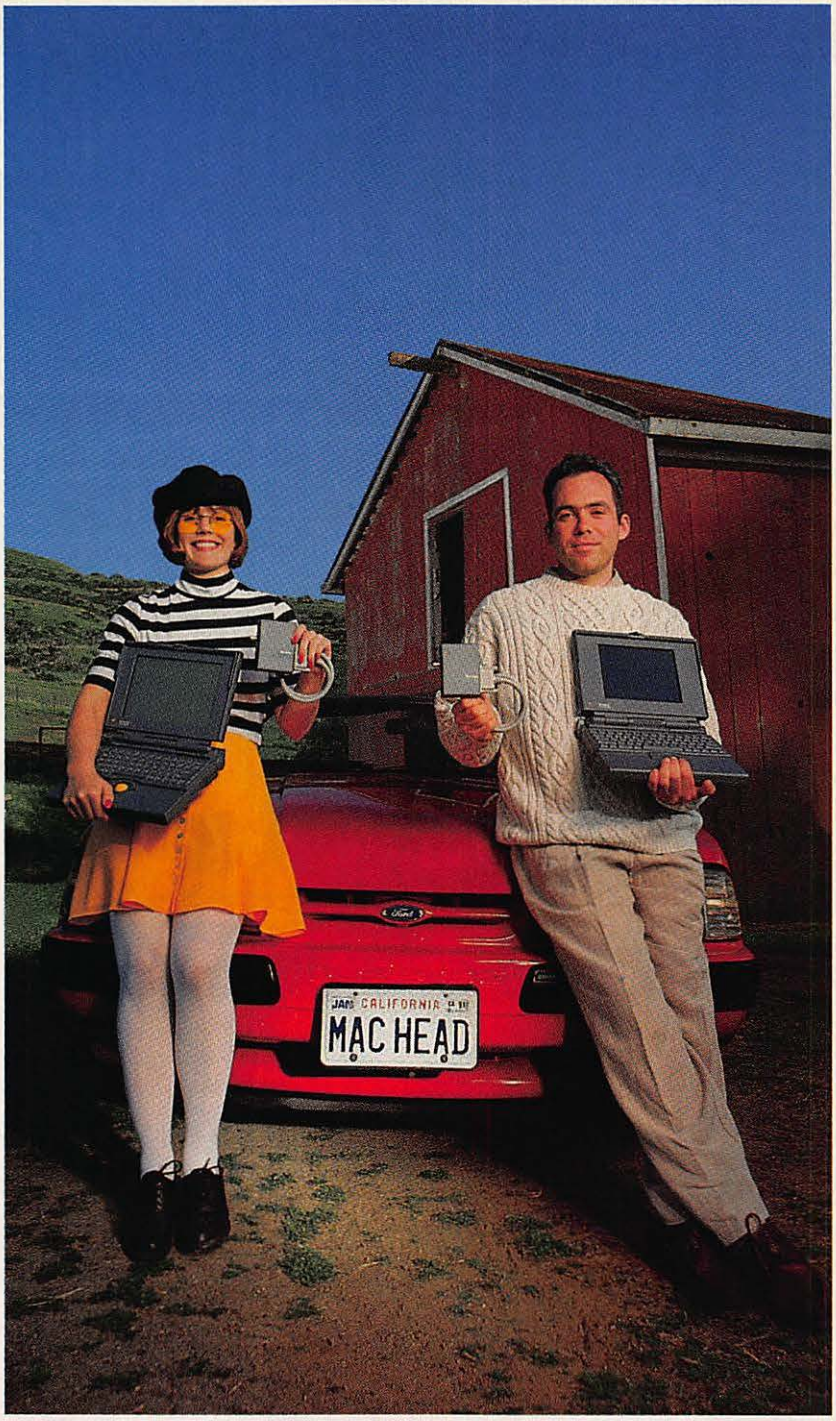
Phantom Power cable so I never have to worry about packing an AC adapter.

The same dependable Xircom brand name as all the PC notebook users have on their LAN adapters.

My calendar appointments from the server.

Xircom's phone number in case someone asks for a recommendation.

A lifetime warranty and upgrade policy.



Sean Scullion
MIS Director

The Xircom name.

Xircom guaranteed compatibility.

Choice of 10Base-T or thin Ethernet via the SCSI port.

10Mbps Ethernet vs. AppleTalk's 230 Kbps access to all my file servers.

Special pass-through SCSI feature for Syquests, CD ROMS and other peripherals for my PowerBook users.

Phantom Power cable that draws from the Apple Desktop Bus so I don't get hassled about AC adapters.

Reversible SCSI cable so both my Powerbook and Macintosh desktop users can use it.

30-day free product evaluation and 37% discount when I purchase the evaluation unit.

Lifetime warranty and upgrade policy.

All my PowerBook users.

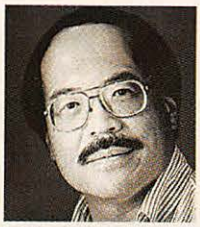


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Circle 269 on reader service card



BY CARY LU

PowerBook Notes

Frequently Asked Questions

SOME QUESTIONS—NO MATTER HOW many times they're answered—seem to get asked over and over again, either by new users or by people who haven't found the right resources. One of these resources is Apple's technical-support line for Macintosh users: 800/767-2775. With the cooperation of the support-line staffers who field such queries, I compiled the most frequently asked questions and answers about PowerBooks.

Q. *Even when it's plugged into the AC adapter, my PowerBook does not always start when I press the power-on button. What should I do?*

A. Try a hardware reset. For 100- and 500-series PowerBooks, simply unplug the AC adapter and remove the battery, leaving it out for ten minutes. For Duos, press and hold the back power button for four to five seconds.

Q. *What is the correct system enabler for my PowerBook?*

A. Models 100, 140, 145, 145B, and 170 require no enabler. The other 100-series PowerBooks use Enabler 131 (131 replaces two earlier versions—Enabler 111, which came with the PowerBook 160 and 180, and Enabler 121, which came with the PowerBook 165c). The 200 series (Duos) use PowerBook Duo Enabler 1.0 (replaces Enabler 201, which was shipped with the early Duos 210 and 230). The 500-series PowerBooks use PowerBook 500 Series Enabler 1.0.2. The latest enablers are available through the usual sources: System Update releases, new system software releases, and many online services. You



can also get them with the System Update 3.0 for $10 (credit card only); call the Apple Order Center, 800/769-2275. Although older enablers will still work, it is a good idea to update to the most current one.

Q. *Why does my PowerBook sometimes become quite warm to the touch?*

A. PowerBooks can heat up during operation, especially on the bottom beneath the keyboard and around the battery compartment during charging. To avoid overheating, leave the PowerBook display open and the feet down during operation, especially when using an external monitor. In some cases, a hardware reset (described above) may work.

Q. *How do I get a frozen cursor unstuck?*

A. First, wait a few moments to see if the PowerBook is just taking longer than expected to finish a task. If the cursor is truly stuck, restart the computer (see the manual for the correct procedure for your model). If the problem persists, you may have a conflict with a system extension; try booting while holding down the shift key, to turn off extensions. If this corrects the problem, you have to restore extensions one at a time to find the offending one and possibly change the order of extensions by renaming them. Or you may need to reinstall your system software because of a corrupted system file.

Q. *What should I do when I connect an external SCSI device to my PowerBook and I see a diamond icon with a number or I can't access SCSI-disk mode at all?*

A. Make sure that you are using the proper cable. When connecting SCSI devices to a PowerBook, use the off-white Apple SCSI System Cable or equivalent (part number M2538LL/A). When connecting the PowerBook to another Mac using SCSI-disk mode, use the dark gray SCSI Disk Cable (M2539LL/A), which has 30 pins at the PowerBook connector (the square end), while the peripheral/system cable has only 29 pins.

Q. *What does it mean when my PowerBook just stops and the screen goes gray?*

A. The computer may have gone to sleep. Press the shift key to wake it up. Or the battery may have completely drained, which also induces sleep mode. If so, plug in the power adapter, let the battery charge for 15 minutes, and then try to wake it up. If this still doesn't work,

continues

PHOTOGRAPH BY PAUL FRANZ-MOORE/SCREEN IMAGE BY JIM LUDTKE

restart the PowerBook (see manual for directions for your model).

Q. *What do I need to use my PowerBook outside of North America?*

A. Apple's PowerBook AC Adapters automatically adapt for all common AC power voltages worldwide (90 to 260 volts). The power frequency (50/60Hz) does not matter. For many countries you will need a plug adapter, available at electronics shops, luggage stores, and airport shops. If you have a third-party AC adapter, check that its voltage range is appropriate for the country you're visiting.

Q. *Why does my PowerBook crash so often?*

A. Two likely possibilities: software conflicts or faulty third-party RAM. First make sure you are using the latest version of all your applications. You may need to replace your system software by doing a clean install from your system software floppy disks: (1) rename your System Folder to "old"; (2) take the Finder file out of that System Folder and put it on the desktop or in the Trash; (3) insert the Install Me First disk and restart; (4) choose Easy Install; (5) after system installation, copy your personal software (control panels, extensions, and so on) from the old System Folder to the new one, and trash the old folder. If you have a third-party RAM card, have your local service technician remove it to see if that corrects the problem.

Q. *Why won't the battery recharge?*

A. Make sure the power adapter is plugged into a live socket. Select Battery (Apple menu); a lightning bolt appears over the battery symbol during charging and disappears when charging is done.

For a Duo with Type I batteries, be sure the battery is fully inserted into the computer. Type II or III batteries don't usually have this battery-contact problem, but if a Type II or III in a Duo 210, 230, or 250 doesn't seem to charge correctly, you need Duo Battery Patch, a free extension from the usual sources.

Q. *Why does my PowerBook go to sleep so soon after I stop using it?*

A. In the PowerBook control panel, move the Battery Conservation slider toward Maximum Performance. PowerBook control panel 7.2 and third-party software let you set the length of time before an idle PowerBook goes to sleep.

Q. *Why doesn't my PowerBook sleep?*

A. A PowerBook will not go to sleep (1) if there is background activity such as printing, file sharing, virus checking, or telecommunications; (2) if it's plugged into AC power and an external monitor is connected (it can dim the external monitor); (3) if AppleTalk is turned on in the Chooser; or (4) if "Don't sleep when plugged in" is checked in the Options section of the PowerBook control panel.

Q. *Why does my active matrix display have dots that never go away?*

A. An active matrix screen contains over 250,000 pixels. Because of the current manufacturing technology, a few defective pixels is common. If screen flaws interfere with your work, call the Apple technical-support line to find out if your screen qualifies for replacement (determined on a case-by-case basis).

Q. *Why does my screen seem so dark?*

A. You may need to adjust the brightness and/or contrast setting. To see if screen dimming has been activated, move the trackball/trackpad. Also, the screen automatically dims when the battery runs low; if this happens, plug in the AC Adapter. Some third-party power managers dim the screen at start-up; to inhibit this, check the settings appropriate for that software, or restart while holding down the shift key. Active matrix color screens do not have contrast adjustments (they don't really need them). Note, however, that all color screens are impossible to read in bright sunlight.

Q. *Why do I see flickering, shadowing, and faint lines on my passive matrix screen?*

A. Some flickering or shadowing is normal, but try adjusting the contrast and brightness, selecting Black & White in the Monitors control panel, or switching to a lighter desktop pattern (in the General control panel).

Q. *What should I do if my external monitor's screen is blank?*

A. Open the Monitors control panel. You should see images of two monitors: the PowerBook display and the external monitor. If you don't see the image of the external monitor, make sure the PowerBook is plugged into the AC Adapter, which is required for an external monitor. Make sure the video cable is securely connected and restart the computer. In the Monitors control panel, click (and hold) the Identify button. A large num-

continues

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Circle 15 on reader service card.



Circle 1 on reader service card



ber 2 should appear on the external monitor display.

Q. *How do I get my cursor to go to my external monitor? How do I invoke mirroring on my external monitor?*

A. Check the Monitors control panel for the presence of a second monitor. You can change the relative positions of the monitors by dragging either monitor icon, so that you can tell which direction to move the cursor to go from one screen to the other. Video mirroring (showing the same image on both screens) is set in the PowerBook Display control panel.

Q. *Why won't my PowerBook read a floppy disk that I formatted on my desktop Mac?*

A. Some extensions block reading floppies—restart and hold down the shift key until you see the message "Extensions Off." Then try reinserting the disk. Also, the disk may be damaged. Try formatting a floppy disk in your PowerBook and use that disk in your desktop machine. If that doesn't work, have your floppy disk drive tested for alignment.

Q. *I have an Express Modem installed. When I start up, why does the Fax Modem extension icon have an X through it?*

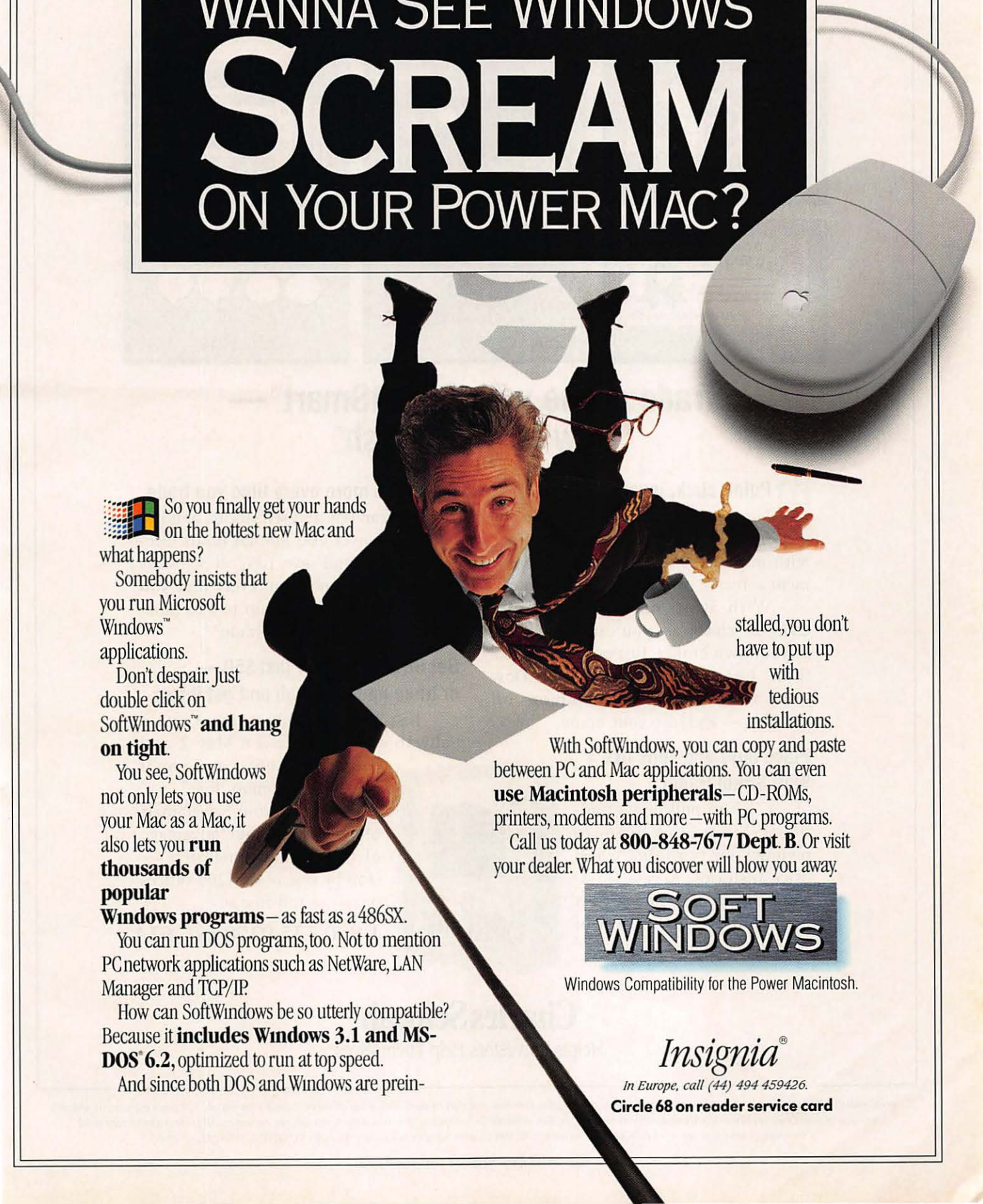
A. The Fax Terminal Pref file (located in the Preferences folder in the System Folder) may be corrupted. A temporary fix is to throw this file away and restart, which automatically creates a new preferences file. This problem was corrected in version 1.0.4 of the Express Modem software. The current version is 1.5, available from the usual sources.

Q. *How do I print to a StyleWriter from a Duo or a 500-series PowerBook?*

A. For PowerBooks with only one serial port (Duos and 500-series PBs), you must disable AppleTalk. Then tell the StyleWriter driver that you are using the modem port. If you have an Express Modem installed, set Express Modem to Off in the Express Modem control panel. If you have a PowerBook Setup control panel, set Modem to Normal. If you are having trouble printing to a StyleWriter from a Duo Dock, get a hardware upgrade from your local Apple Authorized Service Provider. AppleTalk must also be disabled if you want to use the printer port of the dock. **m**

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column.

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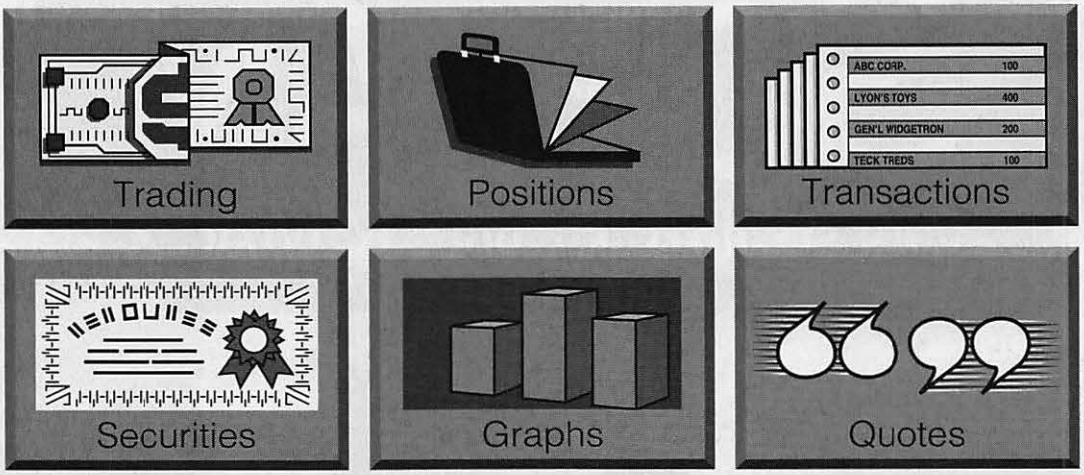
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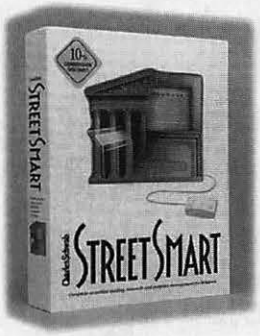
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BY DAVID POGUE

Not Your Father's BBS

FirstClass systems: online services for the rest of us

YOU KNOW WHAT A BBS IS, don't you? It's an electronic bulletin board system. At one end is a Mac Plus and a couple of phone lines in some teenager's bedroom. You, modem junkie, are at the other. You can dial in to the BBS at any hour. By typing commands, you can read Monaco 9-point text describing 32-bit-addressing schemes, download the latest version of MacArmyMan Pro, or post heated messages about the efficacy of mouseball cleaners.

Well, that's what a BBS *used* to be, back when the information superhighway was a couple of dusty bike trails. But times have changed. Courtesy of a remarkable program called FirstClass, the aforementioned BBS operators of America can now replace the boring scrolling text of yesteryear with nifty clickable icons, just like those in America Online or eWorld. The backdrops are colorful, the icons are customized, text comes in all sizes and colors, and there are witty sound effects at every turn. For the first time, you can use a BBS without a degree from MIT.

A FirstClass BBS is multitasking, too. Even as you're downloading, say, a Bart Simpson sound file from the BBS software library, you can simultaneously read messages, type in live conversations with other members, and explore the service. (Try *that* on America Online.) Actually, that's a bad example; on a FirstClass system, you can listen to a sound without downloading it.

The content of FirstClass systems is eye-opening, too; instead of merely serving as a canvas for political user-group mudslinging, these BBSs offer things like faxing, efficient E-mail, and access to the mother of all BBSs, the Internet. And on most FirstClass BBSs, people go by their real names (Bill Smith, Jenny Jones) instead of coy handles (Mac Stud, NoLifeGuy).

(SoftArc, the company that makes FirstClass, wishes to stress that its product's actual purpose in life is to be a corporate communications center, like QuickMail or something, and that 3000 companies use it this way, and that the explosion of FirstClass BBSs is merely an unexpected side effect of the program's stunning success in the business world. Duly noted.)

Here's a sampling of some interesting FirstClass systems; to find one in your own area code, visit the Macworld area of America Online, where I've posted a list of 500 FirstClass BBSs all over the world.

digitalNation

If your mind is easily blown, put on a helmet before visiting this BBS. Its 28 high-speed phone lines connect you to services so varied and useful, they almost make CompuServe look like a garage sale. In my first whirlwind evening, I searched the recipe database for dishes containing prunes, downloaded the complete transcripts of the "Monty Python" TV shows, and sent a fax. Later, I unearthed the entire Bible, Frequently Asked Questions about Seinfeld, 12 complete Shakespeare plays, the transcripts of every speech ever uttered by President Clinton, Apple Product Information, months' worth of David Letterman Top 10 Lists, 4.5 gazillion shareware programs, and enough other surprises to turn me into a gibbering digitalIdiot.



You may have trouble believing this, but digitalNation's information is all well organized and easy to find. You'll definitely have trouble believing this: except for the call to Virginia, digitalNation is *free* (up to 20 minutes a day; you can pay for more access). What's more, if you use digitalNation, you've just stuck your toe into the meganetwork called the Internet; you get your own Internet address, and you have full access to the torrent of messages that gushes through the Internet every day. (Sysop, Bruce Waldack, bless 'im; voice 703/642-2800; modem 703/642-0453.)

DesignLink

DesignLink is no digitalNation; it barely qualifies as a digitalSuburb. But despite its unassuming size, it's worth mentioning for the sheer cleverness of its purpose. It's a resource for art, design, desktop publishing, and photography types. Most of its shareware programs, imported Internet discussions, and announcements pertain to those creative pursuits: there's a calendar of art shows and contests, links to design-industry magazines and companies, and so on.

The heart of DesignLink, however, beats in its Portfolio folder, which makes brilliant use of a unique FirstClass feature. In this area, you double-click on the icons of actual artwork samples from photographers and designers. In seconds, the full-color picture appears on your screen. (You also have the option of downloading them at a low-res 72 dpi.) What an ingenious way for these artists to display their wares—and for clients to window-shop! (Free up to 20 minutes daily, $200 per year to put your artwork online; sysop, Ash Mehta; voice 510/930-6746; modem 415/241-9927.)

continues

PETER HOEY

EastNet

EastNet is everything you ever wanted in a BBS—in 100 BBSs, actually. Its most noteworthy feature is that it links to other BBS systems. Several of EastNet's icons are actually gateways to such worlds as OneNet (a worldwide network of 300 FirstClass BBSs) and, of course, the Internet. Needless to say, you could spend a lifetime exploring all these spokes of the EastNet wheel, but some of the most interesting are Off White and Green (psychiatry), the Missing Children's Network (double-click to see the photos of missing kids), and InvestNet (with online graphs of individual stocks).

According to Michael Wechsler, his co-sysop Robert Knowles "needs some therapy; he's a file pack-rat." Translation: this BBS also has, quite probably, every Mac shareware program ever written. Everyone has access to 20,000 of them; for an extra $10 per year you can also access six CD-ROMs' worth; and Rob will hunt through his 25 *gigabytes* of programs if there's something special you're looking for. ($20 per year, $10 additional for Internet access; voice 718/575-1318; modem 718/767-0157.)

Earth Spirit Online

If you get so addicted to this stuff that you never go out and enjoy the fresh air and sunshine, at least you can *read* about fresh air and sunshine. Earth Spirit is an extraordinarily comprehensive, coherent, upbeat environmental BBS. On it you'll find discussions, announcements, and files that touch every conceivable aspect of recycling, research, environmental politics, camping, health, and so on. There's even an area where people analyze each others' dreams. (Actual reply: "My interpretation of your dream is that you were wishing for a nice salad.")

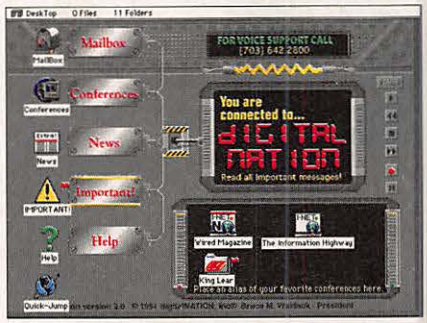
Greenpeace, the Sierra Club, and various California eco-outfits are there, as are several dozen imported relevant Internet discussions. Even I, a Manhattanite who hasn't seen plant life in eight years, found something I'd been looking for: a decent definition of *postconsumer recycling*. A bonus: For some reason, environmentalists don't have the same appalling spelling and grammar of most BBS patrons. (Free up to 30 minutes daily; sysop, Robert Greenhood; voice 310/582-8228; modem 310/264-4785.)

User-Group Systems

Since BBSs are user-driven, noncommercial enterprises, it stands to reason that several of the best are associated with user-driven, noncommercial outfits—Macintosh user groups. (To locate the one nearest you, call 800/538-9696.)

These BBSs harbor the usual FirstClass riches: E-mail, discussions, Mac answers, selected Internet discussions, and the inevitable boxcarful of shareware. But the geographical relevance of user-group BBSs gives them a special zest. For example, on the Los Angeles system, there's an icon called LA Eats, which suggests good L.A. restaurants. BMUG Boston (the East Coast wing of the famous Berkeley, California, user group) has press releases about Senator Kennedy. And the New York system, naturally, includes news of Broadway and the museums.

You're welcome to look around these services for free, even if you're not a member; but your time and access are limited until you pay up. (LAMG membership $36 per year; voice 310/278-5264; modem 310/559-6227. BMUG membership $40 per year; voice 510/849-2684, Planet BMUG [the main BMUG system] modem 510/849-2684; BMUG Boston modem 617/721-5840. NYMUG membership $45 per year; voice 212/473-1600; modem 212/473-1967.)



Digital Cafeteria The icons on digitalNation's industrial-tech welcome screen give you access to a vast, rich, underground world of information, files, and services. Except for the phone call, it's all free for the taking.

The Upshot

These friendly, info-dense services are as dramatic a Mac development as, say, the invention of the mouse pad. Why don't we hear more about them? The pundits can finally quit bellyaching about how hard the Internet is to use—if you connect through a FirstClass BBS, using the Internet is no more challenging than double-clicking a folder.

In short, the quantity and quality of the stuff you'll find in this welcoming cyberland is astounding. After you've visited a few of these magical places, you'll either be stricken with Information Anxiety—or cured of it. **m**

Research assistance by Omar Wasow of NY Online (modem 718/596-5881) and Dallas Kachan of SoftArc (voice 416/299-4723).

Contributing editor DAVID POGUE is the author of *More Macs for Dummies* (IDG Books Worldwide, 1994), which contains, among other things, step-by-step instructions for getting onto the information superhighway without missing your exit.

A FIRSTCLASS DICTIONARY

The world of FirstClass is so exciting, so mind-stretching, that it requires a whole new raft of terminology. Clip, save, enjoy.

Conferences FirstClassese for messages. This is the real bulletin-board part of a BBS, where you can participate in never-ending chains of replies to replies on every conceivable topic.

FirstClass Client Important! This is the free program you need to dial in to any FirstClass BBS. You'll find it in the Macworld area of America Online, among other places.

Gateway A link to another BBS. Unless you're really savvy, you probably won't even know when you're being patched through to a different system.

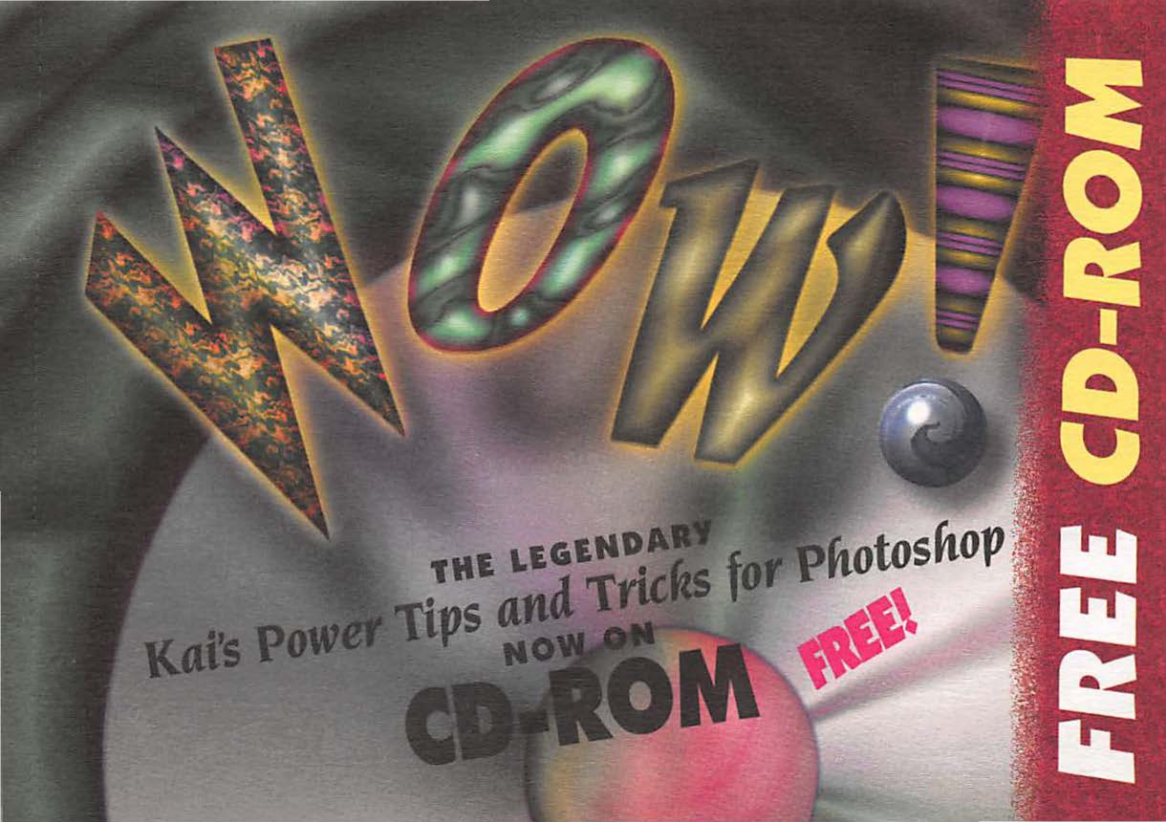
Internet A vast, technical, former military, computer network. It encompasses 20 million people and thousands of universities, companies, and government institutions.

Résumé A wonderful FirstClass feature that lets you read all about other BBS visitors, in their own words.

Settings file What really makes FirstClass BBSs great is that each is different. The welcome screens, the sounds, the icons, the folder arrangements are all customized by the operators of each BBS; all of this information is packaged into a document called the settings file. To enjoy the rich multimediac experience of a certain BBS, you must also obtain its settings file.

I've put the settings files for the BBSs described in this article, once again, in the Macworld forum of America Online. You can also get the settings file from the BBS itself (after dialing in with the FirstClass Client's generic settings).

Sysop The system operator—the poor slob who has forsaken food, family, and friends in order to maintain and administer a BBS.


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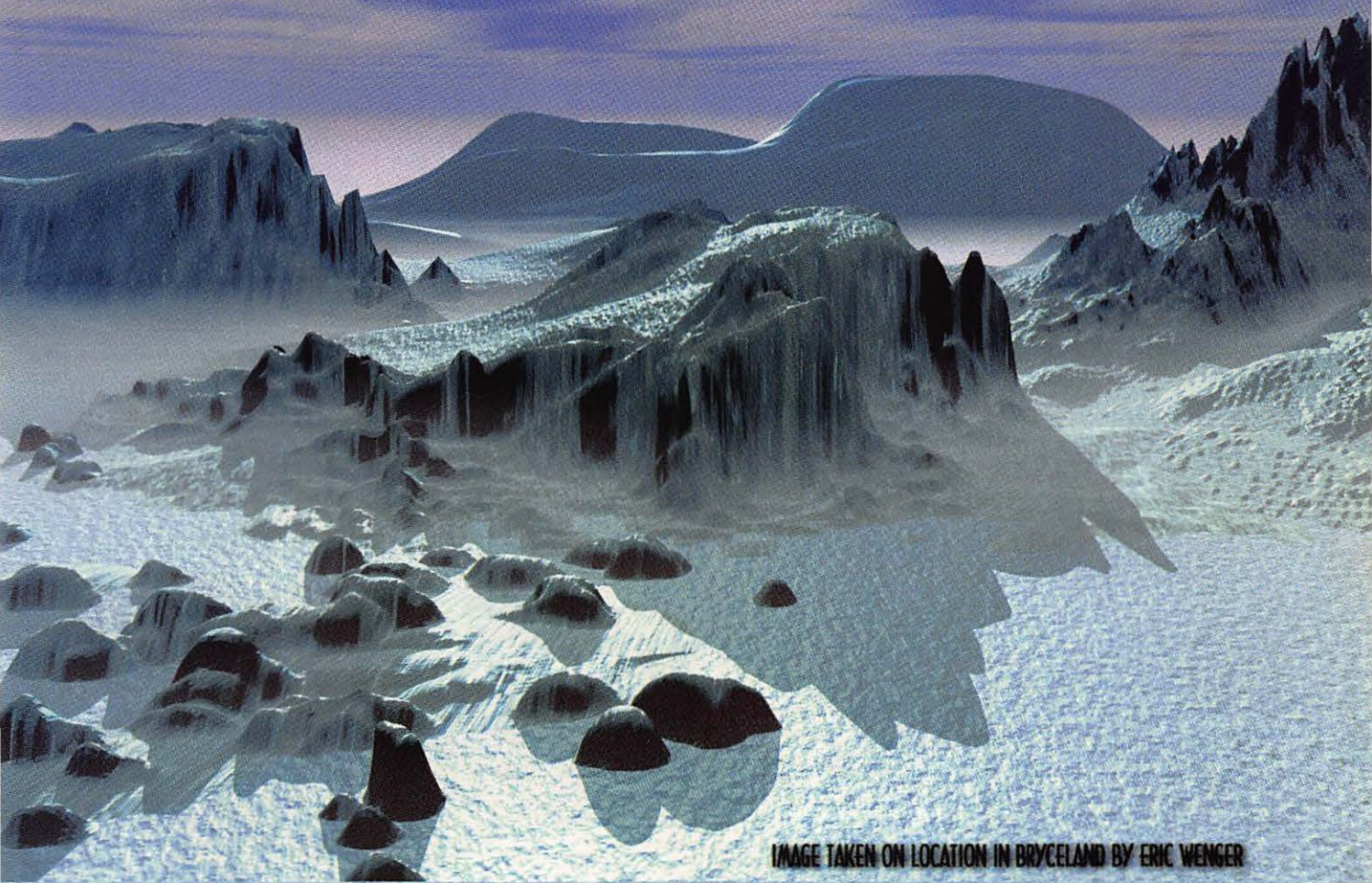


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THE ICONOCLAST

BY STEVEN LEVY

Passing on En Passant

Attention, shoppers: virtual malls don't make it

SHOPPING BY COMPUTER IS one of the best things to come along in years—from a retailer's point of view. The salespeople are software agents, who ask little in the way of wages. The real estate consists of a sales floor inside the consumer's personal computer, on which the retailer pays no rent, mortgage, or taxes. Shoplifting is unheard of. And the customer base is almost limitless, bounded by neither geography nor other real-world constraints like closing one's doors upon the onset of darkness. Is it any wonder that every marketer from Sears to Spiegel is getting in on the action, setting up storefronts in online virtual malls and publishing catalogs on CD-ROM?

What they seem to have forgotten is the customer's point of view. The initial ventures into this brave new world of digital consumerism seem to be driven more by what's good for the retailers than what the poor fish at the other end of the terminal might want. They apparently think we're just dying to spend our leisure hours—and our dollars—making virtual shopping trips in an environment controlled by their software and limited by the choices they offer us. At least that's the impression I got on a whirlwind shopping tour at several outposts of the cyberspace bazaar.

Case in point: En Passant. This CD-ROM–based product is a joint venture between Apple, Redgate Communications (a company experienced in compiling catalogs of Macintosh products), and EDS (a data processing firm). According to Ted Leonsis, the president of Redgate, "En Passant finally delivers on the promise of interactive, digital content delivery and personalized shopping in an environment that will bind buyers and sellers closer together." Last year the partners released a pilot version of En Passant to 30,000 CD-ROM owners; the test was sufficiently successful that the partners will continue with the shopping guide, which subscribers will receive quarterly.

JOHN HERSEY

Annoying Technology

I found it an annoying piece of technology. En Passant has two components: a series of 21 digitized shopping catalogs from well-known junk-mailers to the yuppie trade, the usual suspects from Patagonia to The Pottery Barn, and a set of "departments," which consist of a few screenfuls of multimedia content seemingly digested from old airline magazines and trashed Learning Annex course guides. I sampled the departments first, laboring through several video-bytes of canned wisdom by the likes of Tom Peters. ("Update your résumé every 90 days," he said, jerkily waving his hands in a QuickTime clip.) Then I skipped through a feature about neckties where I learned my tie should say, "Me." All of this, filtered through the sluggish



through-rate of CD-ROM technology, was like an infomercial on quaaludes.

Then I tried the catalogs. In theory, multimedia catalogs have advantages—you can get multiple views of items, seeing them in different colors, for instance. Or you can hear snippets of recordings. Or you can get pop-up calculation devices that figure out sizes and such. It is essential to provide lots of these goodies, because computer catalogs suffer inherent drawbacks—they require a more focused attention, you can't flip pages and make serendipitous discoveries, and you can't read it on the toilet. En Passant falls short in these compensatory features. Though some items are supplied with sounds, there is little in the way of imaginative presentation. When a blouse is offered in six colors, why not let us change the colors we see?

The most useful component of En Passant is the Directory, which lets you go cross-retailer to choose items. For instance, if you're interested in necklaces, the program instantly compiles a custom catalog with items from The Horchow Collection, Tiffany's, The Nature Company, Pastilles, and the New York Museum of Modern Art. Still, Apple admits that the catalogs provided here are skimpier than the ones that are delivered to your mailbox. It's almost like getting a catalog with half the pages torn out.

In the Apple Catalog component, for example, I looked at the item for replacement LaserWriter cartridges and found that the En Passant disc only offered cartridges for the Select series—unlike the old *Apple Catalog*, which offered replacements for the entire range of LaserWriters. And the price was higher, too—in En Passant you get no discount for ordering three.

And if you do want to order something from the En Passant catalog, you can't simply press a button and have your modem call up the service and automatically buy the item—you have to call up or fax your order the old-fashioned way! (An Apple spokesperson says that future versions might allow you to order directly.)

Mall of America Online

So much for CD-ROM. I th[en] sample online shopping ne[ws] on to the shopping dis[trict] Online. The first shoc[k]

continues

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covered that AOL charges the customer for shopping time. (Its main competitor does not: visit CompuServe's virtual mall and you're off the clock.) The next shock came when I actually tried to find something I wanted to buy.

I headed right for the AOL Online Bookstore, run by a company called Read USA. A good sign: a note informed me that every book was sold at a discount price. The most recent Philip Roth book had just come out in softcover, so I tried to locate it with the search function, looking for the keyword *Roth*. The sole response to my query was *Harriet Roth's Fat Counter*. This seemed odd only until I looked deeper into the Online Bookstore and discovered that aside from a relative profusion of computer books, its selection couldn't compare to your average garage sale. Literacy was at a premium, too. In the biography section there were all of 16 books, with 3 devoted to Princess Diana and 3 to Ross Perot. Even the categories betrayed a suspect sensibility—there were separate sections for fiction and literature.

eShop of Horrors

I would like to report that we can expect much better shopping alternatives when the new generation of personal digital assistants come online, but judging from a demonstration I had of eShop, the electronic shopping component geared to the General Magic operating system, I think there will be a shakeout period. Simply reading the eShop press release, which promises "technology that allows merchants to create exciting, personalized shopping experiences for consumers," made my heart sink. Don't they understand? When we sit in front of our computer screens or stare at our blurry little PDAs, we don't *want* shopping "experiences." If we did, we'd leave the house and go to a store! The whole idea of shopping by computer is to *avoid* shopping—those who prefer to do it digitally just want to push a few buttons and get hold of the specific merchandise we need. We don't want to browse—and if we did, we certainly wouldn't want to do it on the hard-to-decipher, black-and-white, 4-inch screen of a General Magic device.

Yet, to my astonishment, when I got a demo of eShop, I was shown a cyberspacey re-creation of the "experience" of going into the sporting goods section of a department store and comparison shopping for a tennis racket. In the real eShop, you'd see a picture of one tennis racket, with brand name and features, and then look at another one and presumably make your decision.

I could not contain myself. "Excuse me," I asked, "isn't a tennis racket the absolute last thing you'd want to buy electronically? Don't people buying tennis rackets usually want to *hold* them before they buy them?"

The eShop representative was nonplussed—he had never heard this question before. But now that I mentioned it, maybe tennis rackets were not the ideal choice for the demo. He asked me to assign no special meaning to this choice, since, after all, it was only the demo. Also, digital merchants can use the flexibility of the eShop system to set up any number of different kinds of environments.

Still, I wondered afterward, eShop could have chosen anything for their demo—why did they choose tennis rackets? After all, the real usefulness of having a PDA with a shopping component is hooking up to vast databases of items, utilizing fast searches to find the specific item you need, and ordering it in a flash. Didn't they *get it?*

At Last I've Found You

Amazingly, one company does get it. Compact Disc Connection (408/985-8982 for online access) is a listing of over 80,000 compact audio discs that can be easily searched by artist, title, category, or other fields. When you find what you want, you order it online, and CDC tries to get it for you (the service claims a hit rate of over 90 percent). The commands on the system are spartan but effective. When you find the disc you want, you can, with a keystroke, get a list of the songs it contains. Many of the CDs are subjectively rated by a star system, and some have short reviews. Often, CDC sells its wares at a discount.

When I accessed CDC through its Internet address (cdconnection.com), I got hooked instantly. Though it is not flashy—no videos of Tom Peters here—and though it makes no claims to be an "experience," Compact Disc Connection provides utility that En Passant has yet to attain. When I get my wireless PDA, Compact Disc Connection will be on the speed-dialer. I want the same sort of service for books, too, as well as other sorts of items. For instance, instead of the lush graphics of an L. L. Bean catalog on CD-ROM, I'd prefer to call up a database that lists everything Bean has ever sold—just in case I want to order a sleeping bag in a hurry. When it comes to shopping electronically, high-bandwidth selection and a quick in-and-out is the future. Spare me the frills, please—I just want to shop till I stop. **m**

STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).

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2. For best results, use block printing for all characters. **Avoid using long tails on your letters since they may tend to cross over neighboring letters.** Remember, what you write here will be the final font.
3. Print the characters shown within each box using the broken lines as a base. Don't forget the punctuation!
4. Print naturally and consistently. Practice first on a separate sheet of paper.
5. Use the supplied fibertip pen. **Do not use ballpoint pens or pencils!**
6. Use the grid lines in the boxes as an aid to maintain consistent height and slant. Be sure capital letters are proportional to lower case letters.
7. Name your font below and complete the name, address, and payment section on the front of this form. **Indicate PC or MAC!**

NOTE: Strike out mistakes and write corrections nearby. Signature Software can even make changes after you receive your font!

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The name must be seven alphabetic characters or less.

symbol 1 | symbol 2

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a b c

d e f g h i j

k l m n o p q

r s t u v w x

y z

Please PRINT the following sentence (using the same style you used filling out this form).

The quick brown fox jumps over the lazy dog.

() { } [] A . B , C ! D ?

E ; F : G " H ' I ` J ~ K _

L # M % N $ O & P | Q @ R ^

S + T – U * V = W / X \ ‘ Y ’

“ Z ” < > 1 2 3 4 5 6 7 8 9 0

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CONSPICUOUS CONSUMER

BY DEBORAH BRANSCUM

Repair Strategies

How to cope with a sad Mac

GOT A BROKEN MAC? MAKE sure it is really busted before taking it in for repair. Between 40 and 60 percent of the Macintoshes that are brought to dealers show no hardware problems, according to repair specialist Larry Pina. "If you're faced with a problem, the chances are fifty-fifty that you don't need to pay any money; you just need to think the problem through."

"Don't assume it's hardware," says Pina. It might be a problem with system software, extension or INIT conflicts, or a change in default settings. The automatic install program for System updates, for example, turns off 32-bit addressing and may change the default printer.

Before you panic, restart the computer with a good System backup on a floppy. "If you can boot with that floppy and connect to your hard drive, it's not the computer," says Pina. (For more software troubleshooting tips, see *Conspicuous Consumer*, July 1993, and "Troubleshooting Tips and Tools," *Macworld*, April 1994.)

If it is a hardware problem and the Mac is still under warranty, any authorized dealer can handle a repair. But owners of older machines also have options. You can still go to an Apple dealer, where a service technician will diagnose the problem, locate the faulty part, and then replace it with an Apple-refurbished part covered by a three-month warranty. You can use an independent service provider, who may also swap out a faulty part and replace it or repair the faulty part. Or you may be able to make the repair yourself.

Larger businesses have similar choices: deal with repairs on a case-by-case basis; develop an in-house repair center; or use a corporate repair service provided by Apple dealers or independent service companies such as Vanstar Corporation (formerly ComputerLand) and GE Computer Services. Vanstar (800/722-2736) and GE (404/ 246-6200) target companies with hundreds of computers, offering a variety of repair and service options, including response times of two to eight hours and next-day service.

One Company's Choice

Although SRI International of Menlo Park, California, has hundreds of Macintoshes, materials coordinator Anita Ledtje doesn't believe it's cost-effective to buy service contracts. "Most Apple products are up and running until the time we unplug them," she says. "The PowerBooks have a hard life, but we don't have that many problems. If we paid for service contracts, it would put us into a hole."

Ledtje's job requires her to eliminate headaches before SRI buys equipment and after, she says. "That's why it's very important to have good service and support." But keeping SRI's Macs in good repair is not easy. Earlier this year, for example, Ledtje sent a PowerBook 170 to a local ComputerLand for a floppy drive repair. Because SRI material is often sensitive, the hard drive was completely erased before it was sent for repair and had to be started up from a floppy-based System. Though Ledtje had explained the situation, a technician called to report a problem with the hard drive. Ledtje tried to explain the situation once more; even so, the PowerBook was returned with the floppy drive still broken.



Next, Ledtje tried Hewlett-Packard, a company she loves for its customer service. When an SRI employee had several problems with his Duo 230, Ledtje bundled up the Duo and MiniDock and sent them to the HP facility in Austin, Texas. "The MiniDock had been fixed, but nothing else worked," says Ledtje, who waited two weeks for the Duo's repairs. "The latch didn't latch; the return didn't return. The Duo was visibly broken." Ledtje negotiated a much lower repair fee from HP, given the result, and in the process learned that HP doesn't repair Macs itself but contracts the work out.

Then an SRI researcher dropped his PowerBook 170, and Ledtje got nervous. She was running out of repair options. The researcher suggested Macadam, a San Francisco Apple dealer he heard about through a local user group. Macadam gave Ledtje the needed service, and owner Tom Santos made the repair process fast and easy.

Dealers versus Independents

Jeff Bierly, co-owner of Atlantic Computer Systems of Toms River, New Jersey, warns against using independent service providers that do component-level repairs, because subsequent repairs may be more expensive. That's because Apple charges two different prices for parts: one for refurbished parts, based on a trade-in program where dealers send the defective part to Apple; and another, much higher price for brand-new parts. If you use an independent for one repair but must go to a dealer for another, you may pay a price penalty.

Still, the gamble can be worthwhile. The price difference between independents and authorized dealers can be dramatic. ComputerWare in San Francisco charges just over $800 to replace a faulty Quadra 700 logic board, for example, while 800-We-Fix-Macs (408/988-2334, 800/933-4962) charges $429 plus shipping. The five-year-old Santa Clara, California–based company charges flat-rate

continues

ANDREW FAULKNER

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10

Macworld

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Networking

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fees for repairing motherboards, PowerBooks, floppy drives, monitors, and other peripherals. Other established independents include MicroDoc (503/344-5335) and Soft Solutions (503/461-1136), both of Eugene, Oregon.

If you prefer to do it yourself, two books by Larry Pina are invaluable. *The Dead Mac Scrolls* (1992, Peachpit Press) describes Mac symptoms, offers probable diagnoses, and suggests solutions. It's particularly useful for folks who don't plan to do their own repairs but want to avoid repair rip-offs. *Mac Classic & SE Repair and Upgrade Secrets* (1993, Peachpit Press) shows the technically talented how to repair common problems with these compact Macs. (For more info, contact Peachpit at 510/548-4393 or 800/ 283-9444.)

A Service Checklist

If your company is too small to field in-house repairs, or you simply find it more cost-effective to go outside, use this checklist to compare service offerings.

- How long has the company or service center been in existence? Although there are exceptions, older businesses may be more stable than start-ups.
- What are the qualifications of the repair technicians? They should be Apple-certified. Certification doesn't guarantee that technicians are highly skilled in repair, but it does mean that they should be able to diagnose any faulty hardware and swap it out if not repair it on the spot. Apple trains techs to locate hardware problems and then replace malfunctioning parts with refurbished ones.
- Is there a fee if no problem is diagnosed? Many companies charge to diagnose a problem, whether or not they find one. In some cases the fee may be applied to the repair bill if a problem is found.
- How long is the warranty? Apple offers a 90-day parts-and-labor warranty on repairs. Independents often have warranties of six months or more.
- What is the turnaround time? It will probably vary depending on work load and staff levels. Some companies offer same-day, while-you-wait service or premium 4-hour on-site response programs. Claims of 24-hour and 72-hour turnaround times are not uncommon; find out what that means. For example, 24 hours may mean that if a company receives your computer on Monday, the Mac will be repaired and shipped out on Tuesday via second-day air, so you get your machine back on Thursday.
- Compare prices. Charges vary by dealer, service, and region. If you know the problem is, say, a dead monitor or broken floppy drive), compare ballpark estimates over the phone. Dealers usually charge a one-hour minimum plus parts; independents often charge a flat fee. But price is not the only consideration. As Anita Ledtje notes, "I'm buying for a business. I'll pay more knowing a company will be here when we have problems."
- If you are considering an independent, ask about inventory and the source of parts. Independents sometimes buy gray-market parts because Apple won't sell to independents directly. As a result, some parts may be tough to locate, which might slow down your repair.
- Does the company offer any special services or programs? 800-We-Fix-Macs offers toll-free technical support. Loaner programs are rare, but customers with clout may be able to negotiate for a loaner computer during the repair period.
- Ask for references and call them. See how the company's claims match the experience of its customers. And check with user groups or online service to get a feel for the company's reputation.

One last thing—when you take an Apple product in for repair to a dealer, ask if the product is covered by an Apple repair-extension program. Apple notifies dealers, though not usually owners, when a particular product will be repaired free of charge beyond its warranty period because of manufacturing problems. Until August 15, for example, Apple is supplying free ROM upgrades for Personal LaserWriter NTRs with certain symptoms. Ask your dealer for details. **m**

SERVICE HERO

Reader Jean-Yvan Fradet of Montreal writes in praise of Data Memory System. After buying four 2MB SIMMs, Fradet found one was defective, so he called Data Memory's tech support for help. "The guy there told me the company would ship me four new SIMMs," writes Fradet. "He told me to try them to see if they worked *before* returning the four previously shipped to me." Data Memory apologized for the problem and refunded the postage fees for returning the first SIMM order; our reader was dazzled by the prompt replacement of a defective product.

Send nominees for sainthood to *Service Heroes, Macworld,* 501 Second St., San Francisco, CA 94107, or via Internet (Branscum@AOL.com). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles. A ❖ next to a product indicates that we chose more than one product in that category. A ◀ next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93

Portrait monitor: 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; $399, with video-display board $549.

Two-page monitor: ❖ L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398. ❖ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; $699, with video-display board $798.

COLOR MONITORS, Oct 93

16- and 17-inch: ❖ ErgoView 17; Sigma Designs, 510/770-0100; $1349. ❖ MultiSync 5FG; NEC Technologies, 708/860-9500; $1355 (NEC's estimated dealer price).

SMALL COLOR MONITORS, Jan 94

14-inch display: ❖ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. ❖ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.

15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; estimated street price $755.

NETWORK HARDWARE

HIGH-SPEED FAX MODEMS, Oct 93

Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $499, Silver $429.

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93

PowerLink DeskNet; E-Machines, 503/646-6699; $699.

EXTERNAL HARD DRIVES, Feb 93

❖ Companion 120; APS Technologies, 800/874-1428; $599. ❖ PocketDrive 120MB; La Cie, 503/520-9000; $699.

INTERNAL FAX MODEMS, Feb 93

❖ PowerModem series; PSI, 408/559-8544; $195 to $495. ❖ PowerPort series; Global Village Communication, 415/390-8200; $229 to $499.

PRINTERS

COLOR PRINTERS, Aug 94

Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; $719.

Solid ink-jet: Phaser 300i; Tektronix, 503/682-7377; $9995.

Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7377, $5995.

DYE-SUBLIMATION PRINTERS, Jul 94

Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; $14,995.

Prepress proofing—tabloid size/most complete: Rainbow; 3M, 612/733-1110; estimated street price of $20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $7999.

General publishing and business: Phaser IISDX; Tektronix, 503/682-7377; $9995.

PERSONAL PRINTERS, Sep 93

Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $359.

PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; $1199 to $1599.

QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

WORKGROUP PRINTERS, Feb 94

High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; $5499.

Best buy: ❖ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2529. ❖ Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; $2329.

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93

$1300 to $1600: ❖ La Cie Silverscanner II; La Cie, 503/520-9000; $1599. ❖ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.

Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; $995.

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93

Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.

Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.

Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93

2.7GB drives: ❖ Nova XL 2700; Microtech International, 203/468-6223; $2999. ❖ Vista 3.5GB; Relax Technology, 510/471-6112; $3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

MACINTOSH UPGRADES, Jun 93

SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU).

SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).

LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599.

Mac II accelerators: ❖ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499. ❖ Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.

IIfx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; $499.

Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

OPTICAL DRIVES, Dec 93

3½-inch: ❖ Epson OMD 5010; ClubMac, 800/258-2622; $959. ❖ 128 MO; APS Technologies, 800/874-1428; $899.

5¼-inch: ❖ Sharp JY-750; ClubMac, 800/258-2622; $1829. ❖ Infinity MaxOptical 11m; Peripheral Land Inc., 800/288-8754; $4113.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94

Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

HIGH-END VIDEO EDITING, June 94

Presentation Video: ❖ MoviePak2 Pro Suite; RasterOps, 801/785-5750; $4199. ❖ VideoVision Studio; Radius, 408/434-1010; $4499.

Corporate Video (Offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.

continues

MACWORLD Editors' Choice

Corporate Video (Online): VideoCube; ImMix, 916/272-9800; $40,500.

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Teleware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

COMMUNICATIONS SOFTWARE, Aug 94
Basic connectivity: ZTerm; David P. Alverson (no phone number available); $30.
Terminal emulation: Crosstalk for Macintosh; Digital Communications Associates, 404/442-4000; $195.
Internet exploration: VersaTerm; Synergy Software, 215/779-0522; $125.

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94
EtherPeek, AG Group, 510/937-7900; $795.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

3-D DESIGN, Aug 93
Price for performance: ❖ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; $299. ❖ Alias Sketch 1.5; Alias Research, 416/362-9181; $995.
All-in-one solution: ❖ Infini-D 2.5; Specular International, 413/253-3100; $695. ❖ StrataVision 3D 2.6.1; Strata, 801/628-5218; $995.

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ❖ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume. ❖ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month. ❖ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; $74.95 per volume, CD-ROM $149.95. ❖ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499. ❖ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Corp., 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; $99 (includes the ability to unlock two families from preselected packages) plus $25 to unlock individual faces or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
❖ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; $295. ❖ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399.
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

ONLINE SERVICES

ONLINE SERVICES, Aug 94
E-mail: America Online; America Online, 703/893-6288; basic monthly fee $9.95.
Reference: CompuServe; CompuServe Information Service, 614/457-0802; basic monthly fee $8.95.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ❖ First Things First; Visionary Software, 503/246-6200; $79.95.
❖ Smart Alarms Plus; JAM Software, 203/630-0055; $75.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

GRAPHING SOFTWARE, Aug 94
DeltaGraph Pro 3 3.0.4; DeltaPoint, 408/648-4000; $195.

SALES-AUTOMATION SOFTWARE, Oct 93
❖ Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495. ❖ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94
Persuasion 3.0; Aldus Corp., 206/622-5500; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

VIRUS KILLERS, Jul 94
Commercial software: Virex; Datawatch, 919/549-0711; $99.95.
Free software: Disinfectant; free from online services.

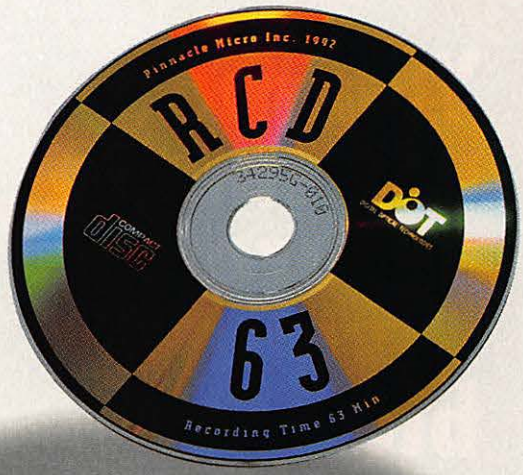
VIRTUAL MEMORY SOFTWARE

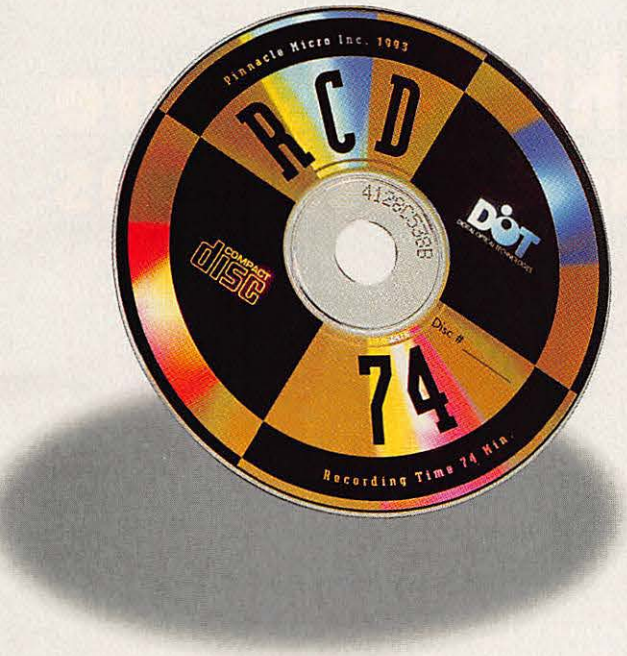
VIRTUAL MEMORY, June 94
Virtual memory Software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory Boosting Software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99.

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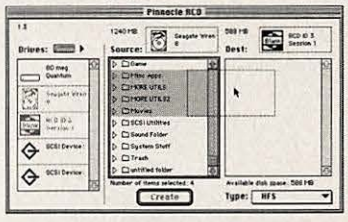
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Star Ratings

OVER 300 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of *Macworld*'s authoritative product reviews from the past year. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones. The ◀ symbol indicates that a product is available in a native Power Mac version, although unless stated otherwise the version we reviewed was the 680X0 version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **4D First 1.0, ACI US, 408/252-4444, $295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, $195 to $2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, $395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, $149.** For simple maps displaying simple data, this map-making tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★★★ **ClarisImpact 1.0, Claris Corp., 408/727-8227, $399.** Business graphing, project management, object-oriented drawing, word processing, and presentation functions merge in this business graphics software. The outstanding integration offers versatility that dedicated programs are pressed to match. Jun 94 ◀

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, $299.** Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93 ◀

★★★★ **Common Ground 1.0, No Hands Software, 415/802-5800, $189.95.** Simple, robust document-interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★★ **Cricket Graph III 1.5, Computer Associates International, 516/342-6000, $129.** Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★★ **DeltaGraph Pro 3, DeltaPoint, 408/648-4000, $195.** At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94 ◀

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, $229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★★ **Helix Express 2.0.1, Helix Technologies, 708/465-0242, $589.** Icon-based relational-database software's improved performance makes it a serious competitor for all-Mac networks. Especially notable is its much faster speed; multiuser operation is downright snappy. Jul 94

★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, $439.** Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★ **Map II 1.5, ThinkSpace, 519/661-4006, $395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, $395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $395 to $1995.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), $100.** Software records dictation and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite, and its propensity to crash. Aug 93

★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695.** When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★★ **Microsoft FoxPro for Macintosh 2.5, Microsoft Corp., 206/882-8080, $495.** Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data it offers excellent performance. Apr 94

★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, $195 to $995.** The efficient user interface of this software sign-out board, in both single-user and networkable versions, makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★★ **Pablo 2.0.1, Andyne Computing, 613/548-4355, $695.** Database-reporting tool is one of the most effective end-user data-reporting tools yet evolved. It puts a considerable workload on the corporate information department, but it sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, $695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★★★ **TopDown 4.0, Kaetron Software Corp., 713/298-1500, $345.** Flowcharting program's support for custom symbols, multiple palettes, and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

★★ **Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95.** Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

★★★ **Wingz 1.1ae, Informix Software, 913/599-7100, $399.** Low-overhead spreadsheet offers advanced-math functionality, a competent calculating en-

continues

Star Ratings

gine and superior charts; but is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. **Jul 93**

COMMUNICATIONS/NETWORKS

★★ **AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. **Apr 94**

★★★ **Crosstalk for Macintosh 2.0, Digital Communications Associates, 404/442-4000, $195.** Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. **Apr 94**

★★★ **Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, $129.** Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. **Feb 94**

★★★★ **DOS Mounter Plus 4.0, Dayna Communications, 801/269-7200, $100.** File-transfer and translation utility works with floppies, removable drives, and network volumes and supports wild cards in DOS extensions. **Apr 94**

★★★★ **EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. **Jan 94**

★★★★ **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, $149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. **Apr 94**

★★★ **On The Air 1.0.1 (1.0.2), Digital Eclipse Software, 510/547-6101, $79.99 to $639.99.** Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. **Aug 93**

★★★ **On The Road 1.1, Connectix, 415/571-5100, $99.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. **Dec 93**

★★★★ **Silver Cloud 1.2, AG Group, 510/937-7900, $495.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. **Feb 94**

★★★ **SITcomm 1.0, Aladdin Systems, 408/761-6200, $120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. **Apr 94**

★★★ **Snap Mail 1.01, Casady & Greene, 408/484-9228, $200 to $1440.** Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. **Jun 94**

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. **Mar 94**

★★★★ **Timbuktu Pro, Farallon Computing, 510/814-5000, $199 to $1999.** Terminal emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. **May 94**

★★ **TrafficWatch II 2.0, Neon Software, 510/283-9771, $495.** The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. Without printing, alarms, triggers, or true multiprotocol support, this product misses the mark. **Jun 94**

★★★★ **VersaTerm 5.0, Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. **Jan 94**

DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. **Jan 94**

★★★★ **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. **Aug 93**

★★★★ **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. **Nov 93**

★★★ **Cumulus 1.1 (1.2), Canto Software, 415/431-6871, $295 to $895.** Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image-preview feature, nor does it offer 32-bit thumbnails. **Aug 93**

★★★★ **FontMonger 1.5.7, Ares Software Corp., 415/578-9090, $149.95.** Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. **Sep 93**

★★ **FotoTune 1.1, Agfa Division of Miles, 508/658-5600, $795.** Color-management software has a capable engine, but it's not the complete color management system Agfa touts. Invisible tech support and poor documentation were only part of the problem. **Apr 94**

★★★★ **FrameMaker 4.0, Frame Technology Corp., 408/433-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. **Mar 94**

★★ **ImageAccess 1.0, Nikon, 516/547-4355, $495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. **Aug 93**

★★★ **Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, $499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. **Oct 93**

★★ **Kudo Image Browser 1.0 (1.1), Imspace Systems Corp., 619/272-2600, $195.** This image-cataloging software cannot control thumbnail depth or compression and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. **Aug 93**

★★★★ **Print Shop Deluxe, Brøderbund Software, 415/382-4400, $50.** Even the most ham-fingered can create professional-looking greeting cards, signs, banners, letterhead stationery and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. **Apr 94**

★★★★ **QuarkXPress 3.2, Quark, 303/894-8888, $895.** This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. **Nov 93**

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, $299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. **Jan 94**

EDUCATION

★★★★ **Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. **Jul 94**

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, $79.99.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. **Jan 94**

★★★ **HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. **Dec 93**

★★★ **MacGrade 1.5.5, CalEd Software, 800/795-0641, $85 to $245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. **Feb 94**

★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. **Jan 94**

★★★ **Small Blue Planet 1.2.1, Now What Software, 415/885-3432, $79.95.** Nicely integrated collection of beautiful Earth-from-space images on CD-ROM lacks many features of standard atlases and doesn't have a search function, but is endlessly fascinating. **Jul 94**

ENTERTAINMENT

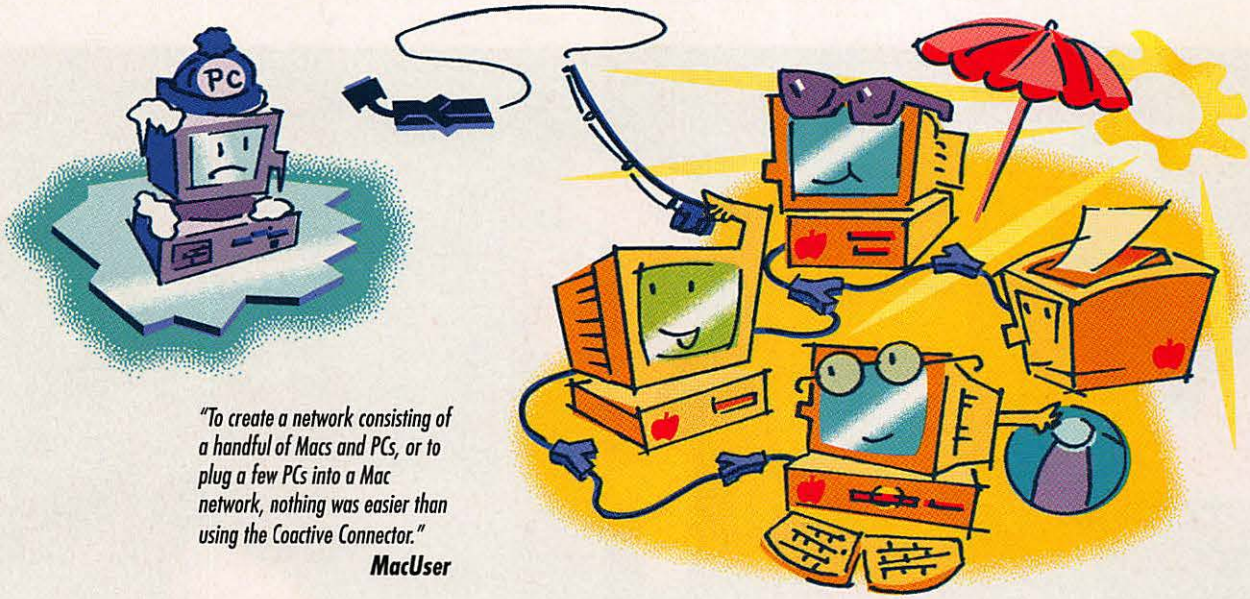
★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, $75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. **Oct 93**

★★★★ **Crystal Crazy, Casady & Greene, 408/484-9228, $49.95.** Ultraglossy, superpolished version of the classic Crystal Quest is challenging and fun without being overly difficult. Each level retains some old elements, and adds some new ones to keep you on your toes. **Jun 94**

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining

continues

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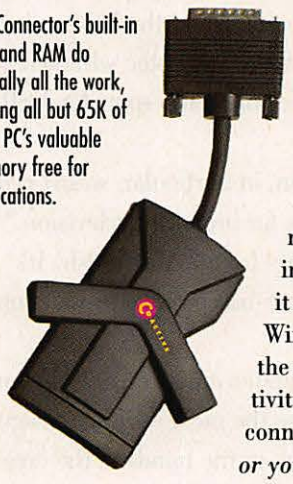
Whether you use your Macintosh™ in a small company, home office, or workgroup, there's probably at least one Windows™ or DOS PC not far from you.

And, while all of your Macs are probably connected to an AppleTalk network, chances are the PC is *not*. Instead, it's left shivering out in the cold—unavailable for file and printer sharing with your Macs and AppleTalk printers.

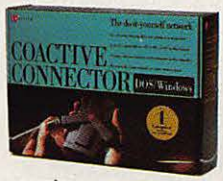
IT DOESN'T HAVE TO BE LIKE THIS.

Now there's an easy way to connect your PCs to your Macintosh network, so that *all* of your computers can share printers and files. It's called THE CONNECTOR™ from Coactive. And in no more than *5 minutes** of installation time per PC, it will let your DOS and Windows colleagues enjoy the simplicity and productivity of AppleTalk connectivity. *Guaranteed, or your money back!*

The Connector's built-in CPU and RAM do virtually all the work, leaving all but 65K of your PC's valuable memory free for applications.



APPLETALK PLUG 'N' PLAY FOR PCs.



With Coactive, there's no need to open the PC to install a complicated networking card. Instead, The Connector plugs right into the PC's external parallel printer port. Load Coactive's PC software, connect to the next computer with simple telephone wire (included), and your Mac-to-PC network is complete.

PCs CAN PRINT TO APPLE LASERWRITERS™.

Now your Macs can exchange files with Windows and DOS PCs. And, your PCs can share high-quality AppleTalk PostScript™ printers like the Apple LaserWriter. Best of all, there's nothing new to learn. You and your PC co-workers use your computers just as you always have. What could be easier?

To purchase The Connector, visit your favorite retailer. Or, call **1-800-PC SHARE, EXT. 162** to order direct for $149.95—25% off the suggested retail price. Plus, you'll receive a FREE copy of *Common Ground*™** for Windows or Macintosh, a $189.95 value!

** Common Ground lets you distribute documents that anyone can view, regardless of their applications, computer, or fonts.

COACTIVE

*Excluding cabling time.

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"When People See What We've Done On The Desktop With VideoVision Studio, They Can't Believe Their Eyes."



Flavio Kampah heads KampahVisions, a broadcast design studio, directing and producing trend-setting, award-winning music videos and television graphics, including the U2 music video, Even Better Than The Real Thing. Flavio became a VideoVision Studio™ devotee while creating a new opening for the American Gladiator TV program and a series of promo spots for ESPN2 and Avirex Jeans.

"Until VideoVision Studio, it wasn't quite there yet. The motion, in particular, wasn't right. But with VideoVision Studio, we can use the Mac to produce work for broadcast television."

VideoVision Studio gives full-screen, full-motion video directly from a Macintosh®. It's a complete, no-compromise, professional quality, 24-bit, QuickTime-based video production system under $4,500.

"After working for years with traditional high-end computer graphics equipment, I'm convinced the Macintosh and technologies like Radius' VideoVision Studio are the most exciting designer tools in broadcast today. It puts control of the creative content back in the hands of the creator."

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VIDEOVISION STUDIO radius

HOW
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VideoVision Studio lets you input, capture, display, edit, add special effects, mix sound and output full-screen video at 30 frames and 60 fields per second. It comes with the hottest video editing and effects software, Adobe Premiere™ and VideoFusion™. And VideoVision Studio is backed by our Lifetime Worry-Free™ Warranty and onsite, overnight replacement guarantee.



No other desktop system offers you such an incredible array of capabilities, so incredibly priced.

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Call 1-800-227-2795 Ext. 88C for more information about no-compromise desktop video production and the name of your nearest Radius reseller. For faxed information, call 1-800-966-7360.

Circle 146 on reader service card

Star Ratings

and informative game is for you. Oct 93

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, $69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

★★★ **Firefall Arcade, Inline Software, 203/435-4995, $49.95.** If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. Jun 94

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $99.99.** Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but overall it succeeds. Jan 94

★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, $59.95.** In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

★★★ **The Journeyman Project 1.0 (1.2), Presto Studios, 619/689-4895, $79.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Myst 1.0, Brøderbund Software, 415/382-4400, $59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, $59.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★★ **SimCity 2000, Maxis Software, 510/254-9700, $69.95.** In essence, your goal with this marvelous city-simulation software is to build a city and run it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. Jun 94

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

★★★★ **Spin Doctor, Callisto Corp., 508/655-0707, $59.95.** In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. Jun 94

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95.** The post–D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

FINANCE/ACCOUNTING

★★★★ **Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95.** The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, $99.** In a straightforward, unintimidating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

★★★ **ExpensePlus 1.0.1, State of the Art, 714/753-1222, $139.95 to $159.95.** Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

★★ **Financial Competence 1.5, Competence Software, 603/435-5098, $99.** Business economics tutorial explains how financial statements are compiled and how they relate to each other, but you could learn the same things from a book, faster and for less money. And that might be the more financially competent thing to do. Jul 94

★★★★ **MacInTax 1993, ChipSoft, 602/295-3110, $69.95.** Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

★★★ **MacInTax Tax Planner, ChipSoft, 602/295-3110, $19.95.** Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

★★★ **MacInTax Tax Savings Guide, ChipSoft, 602/295-3110, $19.95.** Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

★★★ **MacMoney 4.01, Survivor Software, 310/410-9527, $89.95.** Personal-finance software has new and improved features that will please longtime users, but it hasn't kept up with the leaders in the field and won't win many new converts. Jul 94

★★★ **Managing Your Money 6.0, Meca Software, 800/820-7457, $79.95.** Personal-finance program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it isn't as easy to use as the competition, it excels in tax, investment, and financial planning. Jun 94

★★★★ **Quicken 4, Intuit, 415/858-6095, $69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

GRAPHICS

★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, $179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★★ **Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, $595.** The Mac's most dependable draw program has added enough new features to boggle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

★★★★ **Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, $595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, $995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

★★★★ **Blueprint 4, Graphsoft, 410/290-5114, $295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★ **CA-Cricket Draw III 2.0 (2.01), Computer Associates International, 516/342-5224, $249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

★★★ **Canvas 3.5, Deneba Software, 305/596-5644, $399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

★★★ **Collage 1.0.1, Specular International, 413/253-3100, $349.** Image-compositing software is a flawed but serviceable tool that allows you to combine and composite multiple RGB images stored in PICT, TIFF, and Photoshop 2.5 formats. While it's functional and indisputably easy to use, its oversights, including slow screen redraw with no interrupt option, are nearly as numerous as its benefits. Jul 94

★★ **ColorUp 1.0, Pantone, 201/935-5500, $99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

★★★★ **DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299.** Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, $895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

★★★ **Expert Draw 1.0, Expert Software, 305/567-9990, $49.95.** Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

★★★★ **Folio 1 Media Kit-Print Pro, D'Pix, 614/299-7192, $499.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is crisply focused. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, $399.** If you can put up with a few inconveniences, this color paint software pro-

vides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. **Jul 93**

★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, $495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. **Aug 93**

★★★ **Infini-D 2.5.1, Specular International, 413/253-3100, $695.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. **Feb 94**

★★★★★ **Kai's Power Tools 2.0a, HSC Software, 310/392-8441, $199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. **May 94**

★★★★ **MacroModel, Macromedia, 415/252-2000, $1495.** This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. **May 94**

★★★ **Ofoto 2.0 (2.02), Light Source Computer Images, 415/461-8000, $395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. **Jul 93**

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, $99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. **May 94**

★★★ **Pointillist, Pictor GraFX, 310/865-0495, $39.95.** Stereogram software creates images that look, at first glance, like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's gleefully wacky. **Jul 94**

★★★★ **PosterWorks 3.0, S. H. Pierce & Co., 617/338-2222, $395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. **Aug 93**

★★★★ **PowerDraw 4.0 (5.0), Engineered Software, 910/299-4843, $795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. **Sep 93**

★★ **Ray Dream Designer 3.0.3, Ray Dream, 415/960-0768, $349.** Although this 3-D–illustration software remains a price leader, unstable operation, misbehaving features, and sluggish performace are problems that need to be rectified. **Jul 94**

★★★★ **Showplace 2.0, Pixar, 510/236-4000, $495 to 695.** Adequate, entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. **Apr 94**

★★★ **StrataVision 3d 2.6.3, Strata, 801/628-5218, $995.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. **Feb 94**

★★★★ **StudioPro 1.0, Strata, 801/628-5218, $1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. **Mar 94**

★★★ **Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. **Nov 93**

★★★ **Typestry 2.0, Pixar, 510/236-4000, $299.** An approachable interface, animation support, and outstanding Renderman rendering technology make this 3-D type-renderer a popular choice. This version improves on the original, but still lacks canned positioning effects. **Jun 94**

★★★ **upFront 2.0, Alias Research, 416/362-9181, $299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. **Jan 94**

★★★ **Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, $195.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. **Jul 93**

★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, $95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. **Aug 93**

MATH/SCIENCE

★★★ **Alchemy III, Tripos Associates, 314/647-1099, $950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. **Sep 93**

★★★ **Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9376, $79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. **Aug 93**

★★★★ **Caduceus Science Review Macintosh Project 1.0, Scientia, 617/776-3427, $150 to $250.** If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 9MB of files are certain to improve your score. **Apr 94**

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $199.95.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. **Aug 93**

★★★★ **CSC ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $995 to $1595.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000 and required an equally costly minicomputer. It's a winner. **Feb 94**

★★★ **f(z) 6, Lascaux Graphics, 602/299-0661, $115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. **Sep 93**

★★★ **InStat 2.01, GraphPad Software, 619/457-3909, $95.** For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics won't be a problem. **Nov 93**

★★★★ **LabView for Mac 3.0.1, National Instruments, 512/338-9119, $1995.** For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard, in a class by itself. **Jul 94**

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, $595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. **Sep 93**

★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, $245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals. **Jan 94**

★★★★ **Resampling Stats 1.0, Resampling Stats, Inc., 703/522-2713, $225.** Innovative statistics software has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration. **Jun 94**

★★★★ **SerePlot 2.12, Scientfic Visions, 301/593-0317, $135.** If you have piles of data and don't need animated, exploding bar-charts in 24-bit color, this scriptable plotting software should be part of your analysis tool kit. **Jun 94**

★★★★ **Spyglass Dicer 2.0, Spyglass, 217/355-6000, $695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. **Jul 93**

★★★ **Spyglass Transform 3.0 (3.01), Spyglass, 217/355-6000, $595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. **Sep 93**

★★★★ **StatView 4.01 (4.02), Abacus Concepts, 510/540-1949, $595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. **Oct 93**

★★★ **Sum Total 1.01, Concurrent Engineering Tools, 602/464-8208, $99.95.** Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. **Oct 93**

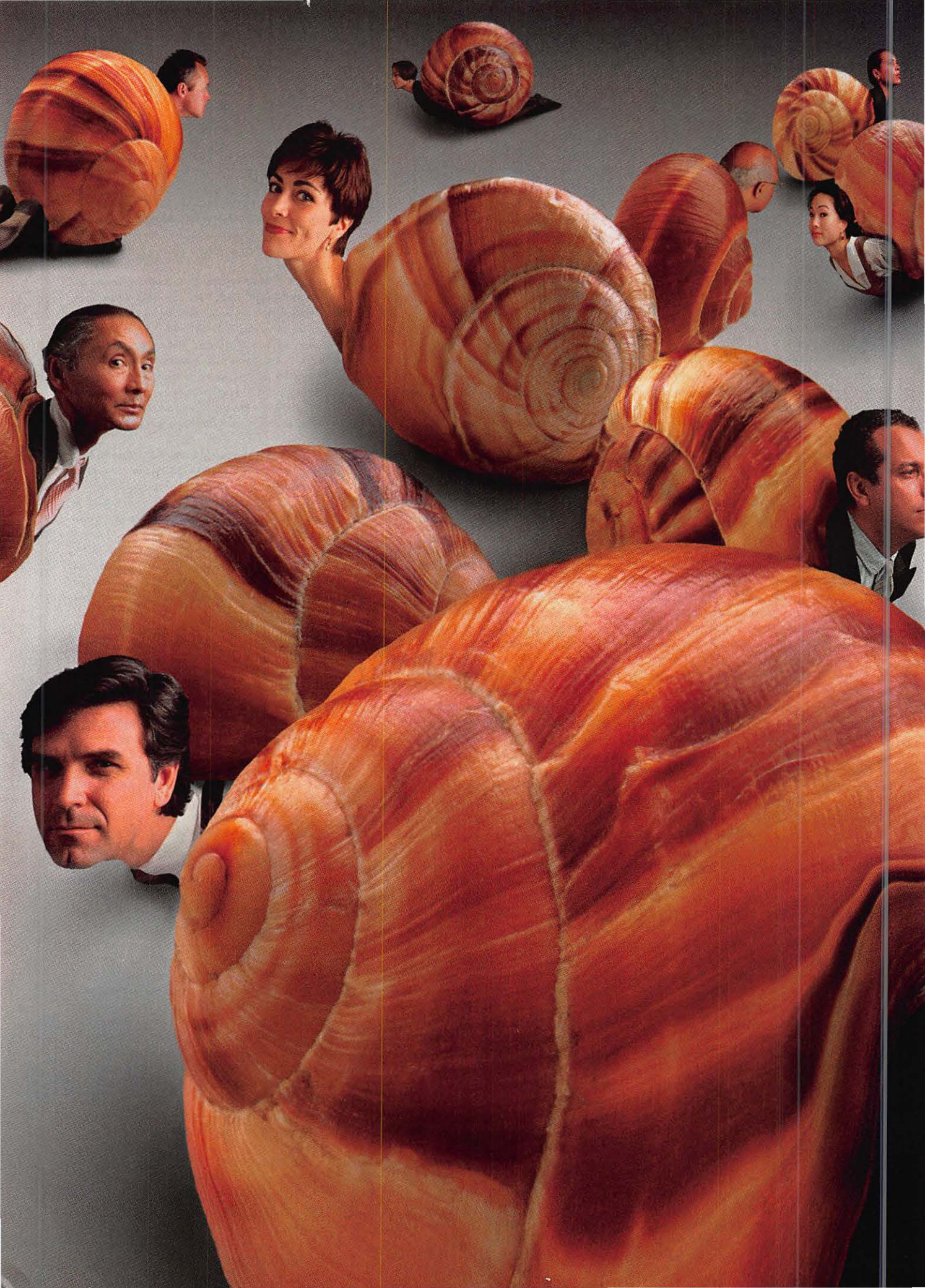
★★★★ **Turing's World 3.0, CSLI Publications, 312/568-1550, $19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. **Feb 94**

★★★★ **Visualization of Natural Phenomena, Telos/Springer Verlag, 408/249-9314, $59.95.** CD-ROM introduction to applying all aspects of computer graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. **Jan 94**

ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02 (1.04), Up Software, 415/921-4691, $69.** HyperCard-based job-

continues





INTRODUCING OneWorld Fax NETWORK FAX SERVER



Talk about perception versus reality. Like something out of a science fiction movie, faxing came into being to move documents along at the speed of light. But in reality, "moving" hasn't been the activity most associated with faxing. "Waiting" has. Waiting for the document to print. Waiting in line. Waiting for the fax to go through. A situation where things can get so bottlenecked, an entire office can be reduced to a crawl.

Well, at Global Village Communication,™ we're happy to report a way to get everyone up to speed again.

And because OneWorld Fax sends faxes in the background over the network, you don't tie up your computer when faxing. You keep right on working.

You save money, too: Printing costs fall when you fax from your computer. Phone bills can be reduced since faxes can be scheduled to take advantage of off-peak phone rates. And, of course, you save valuable time.

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THE PROMISE OF FAX MACHINES IS TO HELP PEOPLE WORK AT A FASTER PACE. THEN, OF COURSE, THERE'S THE REALITY.

With something we call OneWorld™ Fax, the fax server that lets everyone on a network of Apple Macintosh computers fax right from their desk. With OneWorld Fax, everyone in the office can send faxes – to one person or to many – with just a few clicks of the mouse. It's as easy as printing, thanks to the industry-acclaimed GlobalFax™ software used in OneWorld Fax.

But, before you go, here's something else to consider: OneWorld Remote Access – a complete, easy-to-use ARA server for providing access to AppleTalk networks from remote Macintosh and PowerBook computers.

So. There you have it. Two ways to get everyone in your office up to speed again. Now isn't it time you got moving? For more information and for the Global Village dealer nearest you, call 1-800-736-4821, ext. 2246.

GLOBAL VILLAGE
COMMUNICATION

Circle 156 on reader service card

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Star Ratings

search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. **Aug 93**

★★★★ **Arrange 1.1, Common Knowledge, 415/325-9900, $349.** This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. **May 94**

★★★★ **CalendarMaker 4.0, CE Software, 515/224-1995, $59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. **Oct 93**

★★ **ClienTrac 1.7.1 (1.7.2), Whiskey Hill Software, 415/851-8702, $135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. **Aug 93**

★★★ **Contact Ease 2.0.1 (2.0.2), WestWare, 619/274-5053, $395 to $1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. **Aug 93**

★★★★ **DateBook and TouchBase Pro Bundle, Aldus Corp. Consumer Division, 619/558-6000, $149.95.** Calendar and contact manager offer a superior combination of integration, usefulness, and features. If you want to get organized, make sure you look at this dynamic duo. **Feb 94**

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, $89.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. **Aug 93**

★★★ **Now Contact 1.0 (1.0.1), Now Software, 503/274-2899, $99.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. **Mar 94**

★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, $149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. **Oct 93**

★★ **Rae Assist 1.0.2, Rae Technology, 408/725-2850, $199.** Although this personal information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. **Jan 94**

PRESENTATION TOOLS

★★★★ **Adobe Premiere 3.0, Adobe Systems, 415/961-4400, $695.** Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. **Jan 94**

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, $399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. **Nov 93**

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. **Feb 94**

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, $499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. **Feb 94**

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, $1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. **Oct 93**

★★★ **Deck II 2.1, OSC, 415/252-0460, $399.** AV Macs turn into digital-audio workstations with this software that enables you to record, mix, modify, and play back CD-quality sound. It doesn't include equalization features. **Jun 94**

★★ **Elastic Reality 1.0, ASDG, 608/273-6585, $349.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate tech support make that a difficult task. **Feb 94**

★★★★ **FlipBook 1.0, S. H. Pierce, 617/338-2222, $89.** Animation printing utility lets users make flip-books (consisting of a series of printed images that, through application of an extremely technical thumb-and-forefinger method, appear to move) out of QuickTime movies, PICS animations, and Scrapbook files. **Jun 94**

★★★★ **Morph 2.0, Gryphon Software, 619/454-6836, $239.** Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. **Apr 94**

★★★ **Passport Producer Pro 1.0, Passport Designs, 415/726-0280, $995.** Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. **Apr 94**

★★★ **QuickFlix 1.0, VideoFusion, 419/891-1090, $149.** Approachable QuickTime moviemaking software lacks the high-end features of other programs but costs a whole lot less. **Feb 94**

★★★ **VideoFusion 1.0.1 (1.5), VideoFusion, 419/891-1090, $649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. **Jul 93**

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, $995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. **Oct 93**

PROGRAMMING

★★★ **CLImate 1.0, Orchard Software, 617/876-4608, $59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistable package. **Oct 93**

★★★★ **FutureBASIC 1.0 (1.02), Zedcor, 602/881-8101, $299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. **Jul 93**

★★★ **Macintosh Common Lisp 2.0 (2.0.1), APDA, 716/871-6555, $495.** Anyone who likes programming in LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. **Oct 93**

★★★★ **Object Master for Think C and C++, ACI US, 408/252-4444, $255.** Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. **Apr 94**

★★★★ **PG:Pro 1.5 (2.1), Staz Software, 601/255-7085, $169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. **Jul 93**

★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, $225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. **Oct 93**

★★★★ **Smalltalk/V for Macintosh 2.0, Digitalk, 714/513-3000, $495.** Object-oriented development system is now even more viable for commercial projects, while Digitalk's customer support and documentation set a standard other vendors should emulate. **Feb 94**

★★★ **SoftPolish 1.1, Language Systems Corp., 703/478-0181, $295.** Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. **Sep 93**

★★★ **SourceSafe 2.1, One Tree Software, 919/821-2300, $295 to $1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. **Sep 93**

★★★★ **Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, $499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. **Nov 93**

★★★ **VIP BASIC 1.0.1, Mainstay, 805/484-9400, $295.** Popular programming language lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. It's a serious developer's tool, though it's not on the same footing as VIP-C. **Jun 94**

★★★★ **VIP-C 1.0.1, Mainstay, 805/484-9400, $495.** If you've mastered the rudiments of C, this programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. **May 94**

UTILITIES

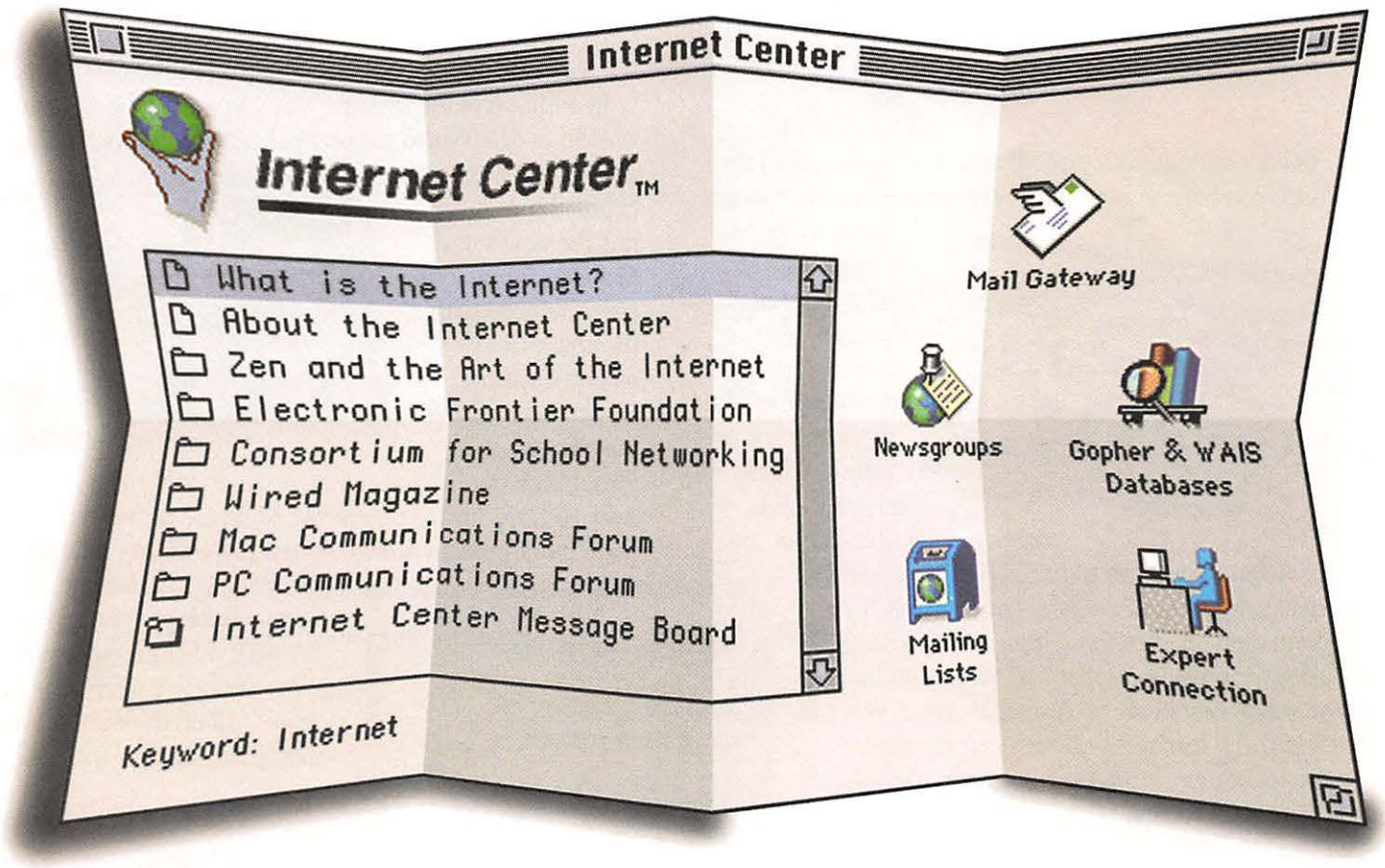
★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, $1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. **May 94**

★★★ **Atticus Vista 1.0, Atticus Software Corp., 203/348-6100, $69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. **May 94**

★★★★ **Automap Road Atlas for Macintosh 2.01 (2.04), Automap, 206/455-3552, $99.95.** Software tells you how to get where you're going better than any other map, atlas, or software our reviewer has seen. Although screen redraw is slow, it's worth it for the written directions and maps the program has to offer. **Jul 94**

★★★★ **CD-ROM ToolKit 1.0.5, FWB, 415/474-8055, $79.** Software accelerator can halve the time it takes to open files and search on a CD-ROM. The product supports a wide variety of formats and CD-ROM drives,

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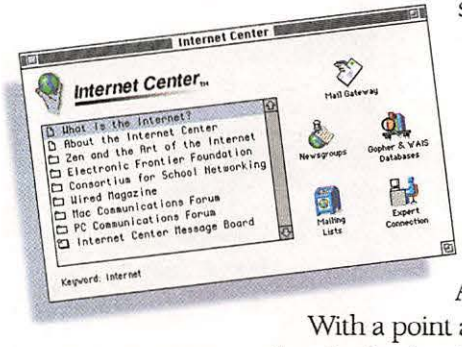
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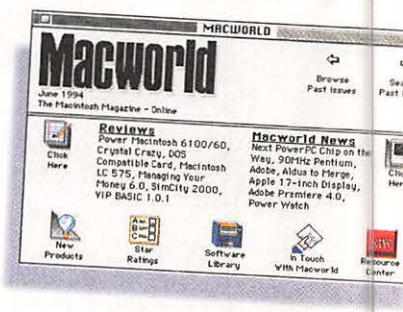
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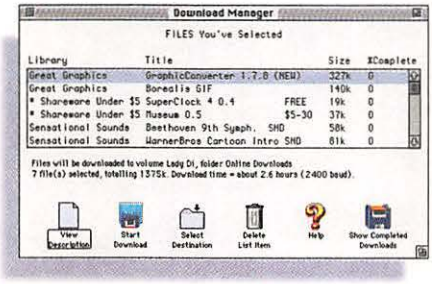
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but users should be aware that playback of QuickTime movies is often uneven. **May 94**

★★★ **Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, $59.95.** Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. **Sep 93**

★★★★ **ClickChange 2.0, Dubl-Click Software, 818/888-2068, $89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look and feel. **Aug 93**

★★★ **Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, $99.** Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. **Nov 93**

★★★★ **CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, $59.** This utility speeds up copying, lets you queue jobs for background copying, and offers a variety of other useful, copying-oriented features—all at a very reasonable price. **Nov 93**

★★★ **Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, $79.** Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. **Nov 93**

★★★★ **CPU 2.0 (2.0.1), Connectix Corp., 415/571-5100, $99.** Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. **Sep 93**

★★★ **CryptoMactic 1.0.1, Kent Marsh, 713/522-5625, $99.** Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. **Feb 94**

★★★★ **DiskLock PB 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $59.** PowerBook security software balances robust security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. **Jan 94**

★★★★ **DiskTop 4.5, PrairieSoft, 515/225-3720, $99.95.** Organizing a crammed hard drive is a more manageable task with this simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. **Jul 94**

★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, $49.95.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. **Mar 94**

★★★ **DriveShare 1.03, Casa Blanca Works, 415/461-2227, $129.95.** This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. **Nov 93**

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. **Jan 94**

★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, $99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. **Jan 94**

★ **eDisk 1.0 (1.2), Alysis Software Corp., 415/566-2263, $149.95.** Driver-level compression software has little to recommend it over file-level, idle-time compression programs. The biggest drawback is the strong potential for disk or file corruption. **Oct 93**

★★★ **Freedom of Press Classic, ColorAge, 508/667-8585, $149.** Utility allows you to print PostScript graphics on almost any non-PostScript printer—easily and with impressive results. **Mar 94**

★★★ **Icon 7, Inline Software, 203/435-4995, $79.95.** Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. **Sep 93**

★★★ **Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, $129.** Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. **Dec 93**

★★★ **I Like Icon 1.0, Baseline Publishing, 901/682-9676, $59.95.** Glitzy utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. **Sep 93**

★★★ **MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149.** The quality of this utility collection is uneven—some modules are unpolished—but if you don't already own AutoDoubler, CopyDoubler, and a good file-management program, it's worth the price. **Jan 94**

★★★★ **MacTools 3.0, Central Point Software, 503/690-8090, $149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. **Mar 94**

★★ **Magic Typist 2.0, Olduvai Corp., 305/670-1112, $129.** If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. **Sep 93**

★★★★ **Mr. File 2.0, Softways, 408/978-9167, $99.** The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. **Dec 93**

★★★ **Now Compress 1.0 (1.0.1), Now Software, 503/274-2899, $69.** Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as or better than other options. **Dec 93**

★★★ **Now Fun, Now Software, 503/274-2899, $45.** Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. **Dec 93**

★★★★ **Now Utilities 4.0.1 (4.0.2), Now Software, 503/274-2899, $129.** Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. **Aug 93**

★★★ **Open Sesame 1.02, Charles River Analytics, 617/491-3474, $99.** Utility automates Finder operations, such as opening and closing files, without resorting to macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. **May 94**

★★★ **OptiMem 1.4.1, Jump Development Group, 412/681-2692, $129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles minimum-memory situations effectively. **Mar 94**

★★★ **Power To Go 2.0, Claris Corp., 408/727-8227, $99.** PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. **Dec 93**

★★★★ **QuicKeys 3.0, CE Software, 515/221-1801, $169.** The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. **Mar 94**

★★★★ **RAM Doubler 1.0.1, Connectix Corp., 415/571-5100, $99.** Inexpensive system extension doubles available RAM for many Mac users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. **May 94**

★★★ **Redux Deluxe 2.0.2 (2.5), Inline Software, 203/435-4995, $79.95.** Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. **Jan 94**

★★★★ **Retrospect 2.0, Dantz Development Corp., 510/253-3000, $249.** Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. **Sep 93**

★★★★ **Retrospect Remote 2.0, Dantz Development Corp., 510/253-3000, $449.** Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. **Sep 93**

★★ **SafeDeposit 1.2, Dayna Communications, 801/269-7200, $189.** Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. **Sep 93**

★★ **Safe or Sorry 1.0, Olduvai Corp., 305/670-1112, $59.** Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. **Oct 93**

★★★★ **SAM 3.5.8, Symantec Corp., 408/253-9600, $99.** Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. **Mar 94**

★★★★ **Screenscapes 1.0.1, Kiwi Software, 805/685-4031, $44.95.** With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. **Nov 93**

★★★ **Square One 1.5.2, Binary Software, 310/582-8293, $74.** Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. **Aug 93**

★★ **Stacker for the Macintosh 1.0.1, Stac, the Data Compression Company, 619/431-7474, $149.** As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. **Oct 93**

★★★★ **Star Wars Visual Clips, Sound Source Unlimited, 805/494-9996, $89.95.** Control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will

continues

Star Ratings

make you remember why you love your Mac. Sep 93

★★★ **Tempo II Plus 3.0.9, Affinity Microsystems, 303/442-4840, $179.95.** Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0, Golden Triangle Computers, 619/587-0110, $149.** This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a system with myriad utilities and system software tools. Mar 94

★★★★ **Toner Tuner 1.0.3, Working Software, 408/423-5696, $24.95.** Inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultraShield 1.252 (1.3), usrEZ Software, 714/756-5140, $149.** Sophisticated security product combines practically every feature you might need into an integrated package, including a lightning-fast version of the U.S. government data-encryption standard. Dec 93

★★★ **UnderWare 1.0.1, Bit Jugglers, 415/968-3908, $59.95.** Inspired, silly fun for your Mac's desktop comes from a control panel that adds three features: a screen saver, desktop patterns, and animations that run on your desktop while you work. The price for this whimsy is mostly in disk space. Jun 94

★★★★ **Virex 5.0, Datawatch Corp., 919/549-0711, $99.95.** The extremely fast, trouble-free performance of this software makes the task of guarding against computer viruses almost painless. Its speed puts it ahead of the pack. May 94

★★★ **Virtual 3.0.1, Connectix Corp., 415/571-5100, $99.** If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★★ **VirtualDisk 1.1a, Continuum Software, 206/695-8136, $69.** Rapid disk cataloging; fast, efficient label-printing; and an excellent disk-copy utility make this software package a wonderful value. Jul 94

★★★ **Working Watermarker 1.02, Working Software, 408/423-5696, $49.95.** Simple, useful system extension allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKETS

★★★★ **Claire, The Personal Music Coach 1.0.1, Opcode Systems, 415/856-3333, $129.95.** Musicianship program teaches pitch and interval recognition, sight singing, and intonation. Although the interface is nonstandard, it's logical and easy to learn. May 94

★★★★ **Finale 3.0.1, Coda Music Technology, 800/843-2066, $749.** Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★ **MacInteriors, Microspot, 408/253-2000, $129.** Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Musicshop 1.0, Opcode Systems, 415/856-3333, $149.95.** MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to satisfy the needs of most MIDI users. Oct 93

★★★ **Roll Call 2.0 (2.5.6 or 3.0), By the Numbers, 603/927-4508, $495 to $595.** 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★ **Sailing Master 1.1, Starboard Software, 313/662-4393, $64.99.** Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

★★★★ **WillMaker 5.0, Nolo Press, 510/549-1976, $69.95.** Legal software quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents. It offers excellent supporting explanations, examples, and background. Jun 94

WRITING TOOLS

★★★★ **MacWrite Pro 1.5, Claris Corp., 408/727-8227, $249.** The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

★★ **MasterWord 5.1, Alki Software Corp., 206/286-2600, $99.95.** The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★ **The Oxford English Dictionary, Oxford University Press, Electronic Publishing, 212/679-7300 ext.7370, $895.** CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability and unforgivably poor design are unbearable. Apr 94

★★★ **Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, $179.** The most comprehensive American-made dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

★★★ **Spelling Coach Professional 4.0.1, Deneba Software, 305/596-5644, $195.** If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★★ **Thunder 7 1.5.3, Baseline Publishing, 901/682-9676, $99.95.** Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★★ **WordPerfect for Macintosh 3.0, WordPerfect Corp., 801/225-5000, $495.** The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★★ **WriteNow 4.0.1, WordStar International, 415/382-8000, $119.95.** Tidy word processor's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it enthusiastic fans. This version adds elegant table capabilities and several PowerBook-friendly features. Jun 94

★★★ **A Zillion Kajillion Rhymes 1.0, Eccentric Software, 206/628-2687, $49.95.** Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores *-ed, -s,* and *-ing* endings). Nov 93

Hardware

INPUT DEVICES

★★ **Apple Adjustable Keyboard, Apple Computer, 408/996-1010, $219.** Keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects ulnar deviation, but many sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. Aug 93

★★★ **Computer Crayon, Appoint, 510/463-3003, $49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. Oct 93

★★★ **DrawingSlate, CalComp Digitizer Division, 714/821-2000, $395.** Digitizing tablet is a good, compact, low-cost implementation of pressure sensitivity, although the battery-operated stylus is a bit heavy. Jun 94

★★ **Gulliver, Appoint, 510/463-3003, $119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface and is an acceptable option for PowerBook users. Oct 93

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, $498.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. Mar 94

★★★ **TrakMate, Key Tronic Corp., 509/928-8000, $149.** Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, $749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

MISCELLANEOUS HARDWARE

★★ **ACS100, Altec Lansing Consumer Products, 717/296-2818, $180.** Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **ACS150, Altec Lansing Consumer Products, 717/296-2818, $150.** Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, $179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

★★★ **Apple Newton MessagePad, Apple**

Computer, 408/996-1010, $699. Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. **Dec 93**

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, $400.** This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. **Jan 94**

★★★ **Ear Phone Streamline AV, Jabra Corp., 619/622-0764, $169.** As a hands-free telephony tool—and as a replacement for the Apple PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Its biggest drawback is that you can't hear other Mac sounds, such as modem tones, when it's plugged in. **Jul 94**

★★★ **EMBARC, Embarc Communications Services, 407/364-2000, $395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. **Sep 93**

★★ **G-Vox, Lyrrus, 215/922-0880, $399.** Hardware-software guitar-instruction package lets your Mac "hear" the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn't live up to the hardware. **Apr 94**

★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, $449.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. **Dec 93**

★★ **Macintosh TV, Apple Computer, 408/996-1010, $2079.** As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. **Apr 94**

★★★ **PowerLink Presentor, E-Machines, 503/646-6699, $499.** Simple, compact Duo dock wobbles a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. **Nov 93**

★★★ **PowerPlate, Technöggin, 513/321-1777, $169.95 to $299.95.** Line of long-lived, external PowerBook battery packs, each of which enables you to work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen though battery pack has hours of time left. **Mar 94**

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, $3995.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. **Mar 94**

★★★★ **ThinPack, VST Power Systems, 508/287-4600, $199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. **Mar 94**

★★★★ **TurboDialer, Advanced Software, 408/733-0745, $79.95.** Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. If you constantly dial phone numbers that are stored in your computer, this product will save you time and energy. **Jul 94**

★★★★ **Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, $149.95.** Powered speakers have a good balanced sound and a great volume range at an outstanding price. **Apr 94**

MODEMS/NETWORK HARDWARE

★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, $1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. **Dec 93**

★★★★ **Cypress PhonePro 1.2, Cypress Research Corp., 408/752-2700, $349 to $950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. **May 94**

★★★ **DataLink PB; Axcell Cellular Interface, Applied Engineering, 214/241-6060, $824.** If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. **Nov 93**

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, $129.** If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. **May 94**

★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, $349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. **Nov 93**

★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, $349.95.** If you're looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. **Nov 93**

★★★ **Watermark Message Central 2.0.2, High Tide Software, 510/704-9927, $499.** If you're willing to put in a lot of effort, you'll find this highly sophisticated voice-mail system supremely flexible. It includes a specially modified modem with voice chip, as well as fax software and telecommunications software. **Jul 94**

PRINTERS

★★ **Address Express, CoStar Corp., 203/661-9700, $499.** Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. **Oct 93**

★★★ **Apple Color Printer, Apple Computer, 408/996-1010, $2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. **Aug 93**

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. **Jan 94**

★★ **Brother HJ-400, Brother International, 908/356-8880, $369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. **May 94**

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. **Mar 94**

★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279.** Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. **May 94**

★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, $839.** Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGrade capabilities, which allow the printer to generate 91 shades of gray. **Aug 93**

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, $1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communications Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. **Aug 93**

★★★★★ **LaserWriter Select 360, Apple Computer, 408/996-1010, $1599.** Low-cost, high-performance, 10 ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. **Apr 94**

★★★ **microLaser Pro 600, Texas Instruments, 800/848-3927, $2148.** Overall, this workgroup printer is fast and provides good print quality. The price is steeper than that of other products, but if you work in a busy office where a really fast printer makes everybody's life easier, the higher price may be worth it. **Jul 94**

★★★ **MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, $999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. **Dec 93**

★★ **Notebook Printer II, Citizen America, 310/453-0614, $399.** If weight and size are your biggest concerns in choosing a portable printer, and you print primarily in black and white, this thermal-fusion printer may be a good choice. If speed is at all an issue, however, other options may be preferable. **Jun 94**

★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, $959.** If you've been holding out for a high-quality personal laser printer that's fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. **May 94**

★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, $5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopier bond. **Aug 93**

★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, $2450.** While this multiplatform printer is fast and prints clearly, many Mac users will find it frustrating as it can't print some TrueType fonts. **Jul 93**

★★ **QMS ColorScript Laser 1000, QMS, 205/633-4300, $9999.** Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don't need to chase rainbows right away, you might wait and see if competition drives prices down and capabilities up. **Jul 94**

★★★ **Silentwriter 640, NEC Technologies, 508/264-8000, $800.** With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, this printer is a capable performer. Generally, it represents hassle-free printing, but it doesn't handle single sheets of paper well. **Jun 94**

continues

Star Ratings

★★★ **Smart Label Printer Pro, Seiko Instruments, 408/922-5900, $299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. **May 94**

SCANNERS

★★★★ **Apple Color OneScanner, Apple Computer, 408/996-1010, $1349.** Tests of this color scanner demonstrate unpolluted colors and sharp image details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. **Jul 93**

★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, $2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. **Dec 93**

★★★★ **Epson ES-800C, Epson America, 310/782-0770, $1499; Macintosh interface kit $399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. **Aug 93**

★★★★ **IX-4015 Color Image Scanner, Canon Computer Systems, 714/438-3000, $1169.** The price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office. If you can get by without legal-size scans, it should serve you well. **Jul 94**

★★★ **LightningScan Portable, Thunderware, 510/254-6581, $459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. **Dec 93**

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/633-4450, $1299.** Add the NuBus JPEG board ($300) and easy-to-use 35mm transparency scanning module ($599) and you get a nifty—if slow—desktop scanning package for a reasonable price. **Jan 94**

★★★ **ScanMaker 35t, Microtek, 213/321-2121, $1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. **Dec 93**

★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, $749.** Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. **Sep 93**

SYSTEMS/STORAGE

★★★★ **DataPak 105, Mass Microsystems, 408/522-1200, $949 to $1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. **Sep 93**

★★★ **EtherDock, E-Machines, 408/541-6100, $699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. **May 94**

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/993-9737, $899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. **Feb 94**

★★ **HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9495.** Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. **Jan 94**

★★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, $795 to $894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. **Sep 93**

★★★★ **LC 575, Apple Computer, 408/996-1010, $1699.** For students and small-business professionals who want high power and the convenience of having everything integrated into one case, this 33MHz 68040 system is an ideal choice. **Jun 94**

★ **NuTek Duet, NuTek USA Corp., 408/973-8799, $2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. **Feb 94**

★★★ **OrangePC, Orange Micro, 714/779-2772, $1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. **Oct 93**

★★★ **PLI 2.4 GB MiniArray, PLI, 510/657-2211, $4815.** Slick and elegant RAID drive worked beautifully in tests, but it costs more than other options and the QuickSCSI board is sensitive to minor SCSI problems. **Apr 94**

★★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, $399.** By changing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. **Dec 93**

★★ **PowerBook 165c, Apple Computer, 408/996-1010, 4/80 $3399.** The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant work environment. **Jul 93**

★★ **PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. **Sep 93**

★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. **Feb 94**

★★★★ **Power Macintosh 6100/60, Apple Computer, 408/996-1010, base model $1819.** Given its price and performance, this Power Macintosh is hard to resist. When developers offer in PowerPC format the software that most business users run daily, this should be a system that will give you power to spare. **Jun 94**

★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 $979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of a standard entry-level 486SX-based Windows PC. **Mar 94**

★★★★ **Quadra 800, Apple Computer, 408/996-1010, 8/230 $4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. **Aug 93**

★★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 $4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. **Dec 93**

★★★ **SCSI MicroDock, Newer Technology, 316/685-4904, $175.** Tiny Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. **May 94**

★★★★ **SledgeHammer2000FMF, FWB, 415/474-8055, $3179.** RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. **Apr 94**

★★★ **SmartStack, Envisio, 612/628-6288, SmartSource $119; SmartModules $289 to $1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. **Sep 93**

★★★ **Turbo 040, DayStar Digital, 404/967-2077, $1899.** This accelerator card has the fastest 68040 chip available and is as fast as or faster than any Mac in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. **Dec 93**

VIDEO/DISPLAY

★★★ **Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, $749.** If you're in the market for a medium-quality, digital color camera that costs less than $1000, this is the best deal around. But if you're not in a hurry, you may want to wait until some of the camera's more obvious problems, such as its fixed-focus lens and lack of a zoom option, are ironed out. **Jul 94**

★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, $769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. **Dec 93**

★★★ **Dycam Model 3, Dycam, 818/998-8008, $895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image-quality requirements. **Sep 93**

★★★ **Editing Aces Suite, RasterOps, 801/785-5750, $3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. **Nov 93**

★★★ **Intellicolor Display/20, Radius, 408/434-1010, $3199.** Although with its exceptional brightness and clarity this monitor would be a fine addition to any designer's desk, the included Intellicolor software, which lets you control the settings of your display, doesn't offer much added value. **Apr 94**

★★★★ **MovieMovie, Sigma Designs, 510/770-0100, $349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. **Dec 93**

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, $1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. **Oct 93**

★★★ **QA-350 LCD, Sharp Electronics Corp., 800/237-4277, $2495.** At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative for presenters who don't need multimedia capability. **Jul 94**

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, $279.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. **Sep 93** m

Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings include both time-sensitive promotions and long-term offers being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an **Editors' Choice**, or have won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version. The ◀ symbol indicates that the product is Power Mac related.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld,* 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

FlexScan Monitors + Colorific Nanao USA will begin shipping Sonnetech's Colorific software-only color-management system, once it becomes available in August, to all FlexScan monitor (Jan 94 "Small Wonders" **Editors' Choice** for FlexScan F340i•W) customers who return their warranty registration cards. The Colorific versions destined for Nanao customers will list all FlexScan models on a menu, along with a standard VGA setting for non-Nanao monitors. Call 800/800-5202 for more information.

Last Resort + Toner Tuner 1.0.6 + Working Watermarker 1.0.6 Working Software is offering a bundle of 3 of the 16 best utility programs (Apr 94 "Top Utilities"): its $49.95 Last Resort for storing keystrokes in text files; its $24.95 Toner Tuner for adjusting how much toner should be applied to each print job (Dec 93 ★★★★ for version 1.0.3); and its $49.95 Working Watermarker for printing or faxing text or graphics watermarks in the background of a page (Jan 94 ★★★ for version 1.02). Available direct (800/229-9675) for $89.95.

MoviePak2 Pro Suite RasterOps has combined several third-party products with its $1849 MoviePak2 compression daughterboard, $3249 24XLTV display adapter, and $649 Video Expander II RGB/NTSC encoder box to create a $4199 full-motion, 60-field QuickTime video-production system (Jun 94 "Video-Editing Tools" **Editors' Choice**): Adobe's $695 Premiere 3.0 QuickTime video-editing software (Jan 94 ★★★★); AlSoft's $89.95 DiskExpress II disk-optimizer utility; and a special RS-422 Pro version of Abbate Video's $99 VTK Plug In Pack for professional VTR control. Call 800/729-2656 for more information.

PowerBook 500 and Duo 200 Series + 12 Utilities + PowerPort/Mercury Apple has integrated software into its 68040-based PowerBooks starting at $2269 and Duos starting at $2639 (Jul 94 "PowerBooks: The Next Generation")—including Apple Remote Access Client 2.0 for server connection, Macintosh PC Exchange 1.0.2 to read and write DOS/Windows floppy disks, PowerBook File Assistant synchronization package, PowerBook Control Strip 1.0 power-management utility, PowerTalk electronic-mail–management extension (for models with 12MB of RAM), and DataViz's MacLinkPlus Easy Open Translators for converting between Mac and DOS/Windows file formats. In addition, the 500 series comes with Global Village's 14,400-bps PowerPort/Mercury internal fax modem and GlobalFax application, plus ZTerm data communications software.

SuperPaint 3.5 + HomePublisher 2.0 Aldus is bundling these two products in a Paint & Publish one-box collection with an "estimated street price" of $89.99. SuperPaint includes pressure-sensitive drawing tools, TWAIN support, and a QuickTime plug-in module. HomePublisher (formerly Personal Press) is an entry-level page-layout program that includes document templates, T/Maker Clickart images, 12 Bitstream TrueType fonts, and specialty paper. Call 800/888-6293 for more information.

Thunder 7 1.5.3 + Magnet 1.0 + CPU 2.0.1 + Full Contact 2.01 Baseline Publishing is bundling its $99.95 Thunder 7 spelling checker and thesaurus (Nov 93 ★★★★) with No Hands Software's $129.95 Magnet intelligent-agent-based utility for automating file management (Feb 93 ★★★★), Connectix Corporation's $99 CPU PowerBook utility (Sep 93 ★★★★ for version 2.0), and FIT Software's $169 Full Contact personal information manager (Aug 94 ★★★). Available through MacWarehouse (800/255-6227) for $79.95. *Offer expires 8/31/94.*

SIDEGRADES/UPGRADES

CalendarMaker CE Software is offering users of this calendar-making program (Oct 93 ★★★★ for version 4.0) a choice of upgrading to version 4.1 for $25, or to version 3.0.2 for $10. The 4.1 upgrade features over 50 layout styles, recurring-events editors, two formatting palettes, and six paint tools for color icon editing. The upgrade to 3.0.2 is available to those who are content with their current version's functionality but require System 7 compatibility. Call 800/523-7638 for more information. *Offer expires 8/31/94.*

Mathematica 2.2 Wolfram Research is offering the $995 Enhanced Version (requires math coprocessor) of this symbolic mathematical computation system (Sep 93 ★★★★ for the Standard Version) to users of any other technical software program, for $395. Call 800/441-6284 for more information and to order. *Offer expires 7/15/94.*

PowerMerge 2.0 Leader Technologies is offering this file-synchronization program (Aug 94 ★★★★) for $49 (regularly sells for $79) to users of competing synchronization and backup programs or PowerBook utility programs. Call 800/922-1787 to order. *Offer expires 9/30/94.*

SPECIAL DISCOUNTS/REBATES/OFFERS

◀ **ClarisImpact** Claris Corporation is offering a special $149 introductory price for the native Power Mac version of this $399 integrated business-graphics program (Jun 94 ★★★★ for the 680X0 1.0 version). In addition, users of calendar-making, flowcharting, project-scheduling, data-charting, and organizational-charting programs can trade up to ClarisImpact (both the 680X0 and Power Mac versions are included) for $99. Call 800/544-8554 for more information. *Offer expires 9/30/94.*

Claris Organizer Claris Corporation is offering a special $49 introductory price for this soon-to-be-released (early August) $99 integrated personal information manager that allows you to access contact-management, calendar, to-do, and notes capabilities from a single floating palette. Call 800/325-2747 for more information. *Offer expires 9/30/94.*

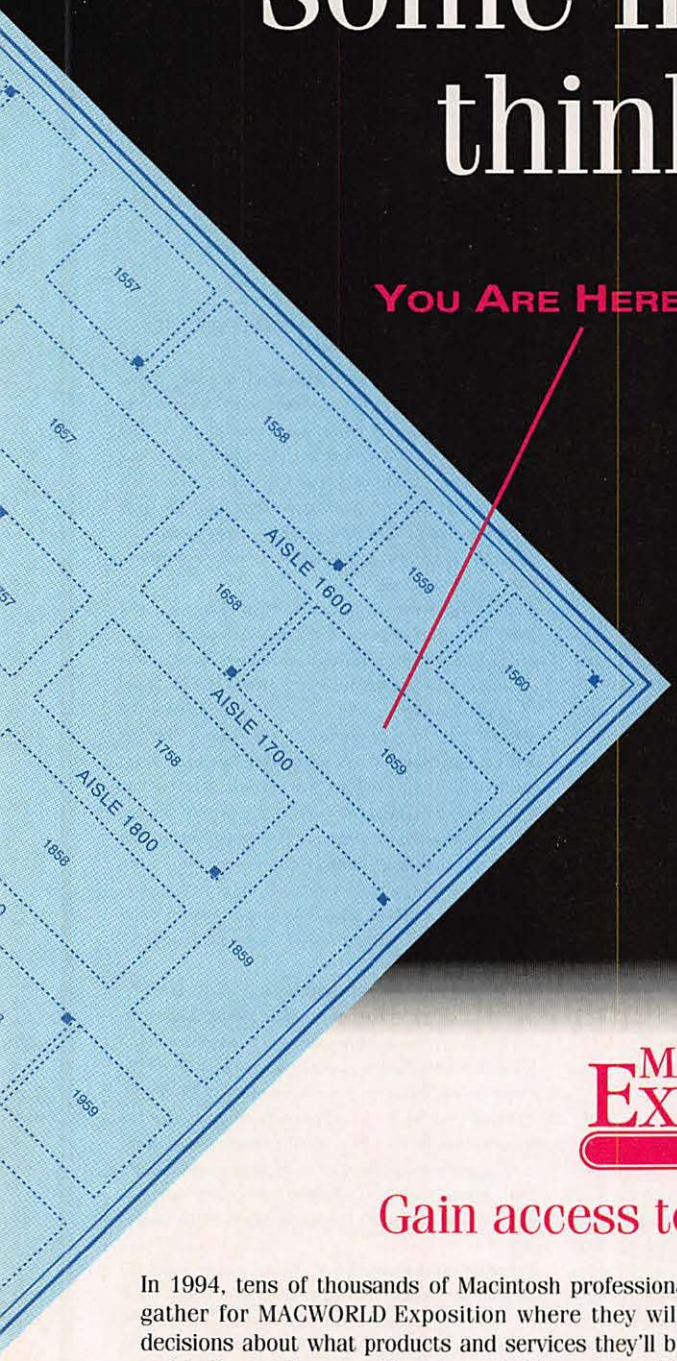
Expert Pad Newton 1.3 Operating System Sharp Electronics is offering version 1.3 of the Newton OS (version 1.05 can be downloaded from America Online or CompuServe with a Newton Connection Kit) to Expert Pad users for $49 (Apple charges $99, which includes two Newton applications). Besides increasing performance and fixing bugs, version 1.3 adds enhanced letter-by-letter and deferred handwriting recognition. Call 800/237-4277 for more information. *Offer expires 8/15/94.*

◀ **Power Macintosh Computers** Apple Commercial Credit, a partnership between Apple and Dana Commercial Credit, is offering rebates on every Power Macintosh it leases, according to the following schedule: $100 for the model 6100/60 (Jun 94 ★★★★) or 60AV; $200 for the 7100/66 (Aug 94 ★★★★★) or 66AV; and $300 for the 8100/80 (Aug 94 ★★★★) or 80AV. Customers who already have upgradable equipment on an Apple Business Lease can add a Power Macintosh upgrade to their current lease. Call 800/225-0513 for leasing program details. *Offer expires 9/30/94.*

TelePort and PowerPort Global Village is offering purchasers of its $349 TelePort Mercury, $279 TelePort Gold (Oct 93 "High-Speed Fax Modems" **Editors' Choice**), $399 PowerPort/Mercury, and $349 PowerPort/Gold (Dec 92 ★★★★) 14,400-bps and 19,200-bps fax modems a $100 rebate coupon toward the purchase of its $999 ($1199 for one-line LocalTalk; $1899 for two-line Ethernet) OneWorld Remote Access fax server (Aug 94 ★★★). Call 800/736-4821 for more information. *Offer expires 9/30/94.*

VideoVision Studio Radius is offering a $500 trade-in rebate toward the purchase of this $4495 video-production system (Jun 94 "Video-Editing Tools" **Editors' Choice**)—which comes bundled with Adobe Premiere (Jan 94 ★★★★ for version 3.0) and VideoFusion (Jul 93 ★★★ for version 1.0.1)—to owners who trade in a New Video, RasterOps, Sigma Designs, or SuperMac video-capture board. Call 800/966-7360 for more information. *Offer expires 8/31/94.* m

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Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

01 ❑ 1000+
02 ❑ 999 - 100
03 ❑ 99 - 25
04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

05 ❑ Apple Workgroup Servers/ Mac Quadra-series
06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

21 ❑ Initiate/Determine need for product/capabilities/features
22 ❑ Evaluate, recommend, or approve brands/models
23 ❑ Evaluate, recommend, or approve purchase source
24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

25 ❑ $1 million or more
26 ❑ $999,999 – $500,000
27 ❑ $499,999 – $100,000
28 ❑ $99,999 – $50,000
29 ❑ $49,999 – $10,000
30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

31 ❑ Business software (Word processing, spreadsheet, database, etc.)
32 ❑ Graphics/publishing software
33 ❑ Monitors/displays
34 ❑ Printers/scanners
35 ❑ Networking/communications hardware and/or software
36 ❑ Multimedia/AV hardware and/or software
37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

38 ❑ Computer Reseller/VAR/VAD
39 ❑ MIS/DP/IS/Network Management
40 ❑ Engineering
41 ❑ R&D/Scientific
42 ❑ Corporate/General Management
43 ❑ Accounting/Finance
44 ❑ Marketing/Sales/PR/ Communications
45 ❑ Art/Design/Creative Services

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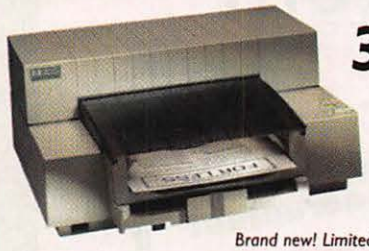
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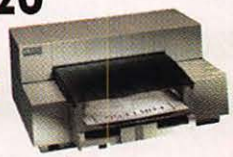
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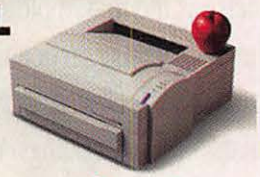
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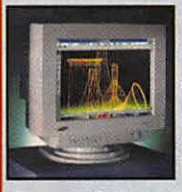
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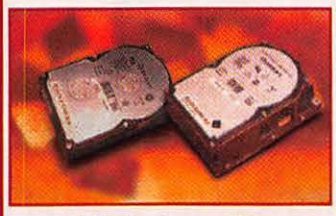
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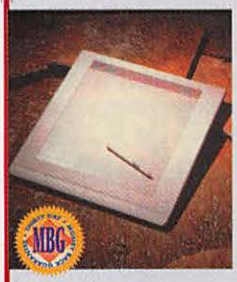
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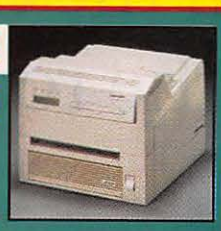
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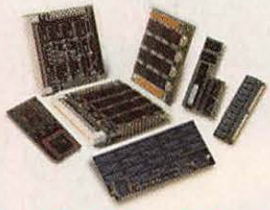
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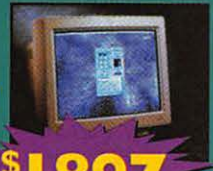
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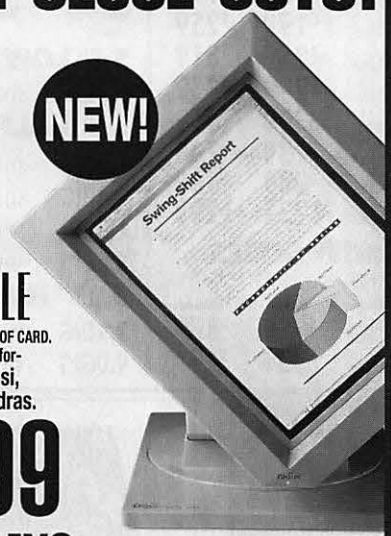
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E-Machines ColorPage 15	$499	$1307
•15" full page color display •35% larger image area •Flat tension mask screen		
Radius Grayscale Pivot	$499	$535
•Portrait and landscape orientations •Grayscale •Built-in video compatible		
Full Page Display	$399	$530
•640 x 870 resolution •75 Hz refresh •Grayscale •Built-in video compatible		
Radius Color Display/21	$1899	$1989
•Compatible with Centris or Quadra built in video (16 bit on Quadra 950) •1152 x 870 resolution •True WYSIWIG mode		
Precision Color Display/19	$1499	$1749
•Compatible with Centris or Quadra built in video (16 bit on Quadra 950) •Multiple resolution switching 'on the fly'		
Precision Color Display/19 with 24 bit video card	$2298	$1749
Sony 20" Color Trinitron	$1899	$2065
Radius 21" Grayscale Display	$899	$978
•Grayscale •Compatible w/Centris or Quadra built in video		
RasterOps 20" Color Display	$1499	$1446
RasterOps 20" ColorTrinitron	$1899	$2209

ROCKETS/ACCELERATORS

RADIUS ROCKET 68040 FROM $599

•68040 processor •Supports up to 128 MB of standard RAM in 8 SIMM slots •QuickDraw acceleration w/Radius boards

	YOUR PRICE	DEALER COST
Radius Rocket 33 MHz	$899	$1248
Radius Rocket 25 MHz	$699	$999
Radius Rocket 25i	$599	$830
RocketShare — *Multiprocessing on your Mac!*	$299	$359

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Mac IIx 0/0, 800K/1.4MB	699/799
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Mac IIci 0/0, 800K/1.4MB	799/899
Quadra 840AV, 900, 950, 800, 700	CALL
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PowerBook 140 4/40	999
All other CPUs	CALL

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Quadra 900 to 950	999
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Mac II FDHD upgrade	399

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DCA Mac Irma 3270 for SE30	499
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Ethernet LC thin coax	99
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CARDS- Misc.

B&W TV card for Nubus	199
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IIsi Daystar Dual PDS adapter	99
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TrueVision NuVista+ 2MB	1999

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Apple 8.24	399
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Apple 21" TPD Mono/Gray Scale	999
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Qume ScripTen	1399
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Mac Plus logic, No ROMs	99
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LPS 270mb Internal



- Fast SCSI-2
- 4,500 RPM
- 10ms access time
- WriteCache & DisCache Firmware

$259

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty

LPS & PRODRIVE SERIES

3.5" LOW PROFILE

Capacity	Access	Internal	External
85mb	17ms	$135	$195
170mb	14ms	$199	$259
270mb	11ms	$259	$319
340mb	11ms	$299	$359
540mb	10ms	$399	$459
1080mb	9.5ms	$739	$799
1440mb	9.5ms	$909	$969
2100mb	9.5ms	$1239	$1299

GO•DRIVE SERIES

2.5" POWERBOOK DRIVES

Capacity	Access	Internal	External
170mb	17ms	$259	$379
256mb	17ms	$339	$459

Seagate

ClubMac 30 DAY MONEY BACK GUARANTEE

Seagate drives carry a ONE Year Warranty

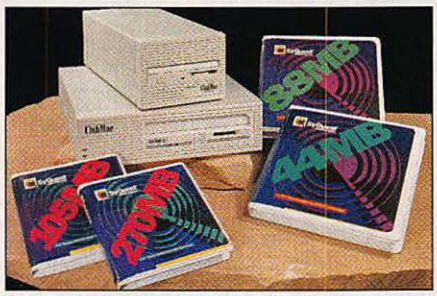
Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" LOW PROFILE						
1.2GIG	ST31200N		10ms	1000mb	$869	$929
3.5" HALF HEIGHT						
1.9GIG	ST11900N		9ms	1600mb	$1199	$1259
2.4GIG	ST12400N		9ms	2000mb	$1549	$1609
1.9GIG	ST11950N	*Barracuda 1*	8ms	1350mb	$1489	$1549
2.4GIG	ST12550N	*Barracuda 2*	8ms	2050mb	$1745	$1805
5.25" FULL HEIGHT						
3.4GIG	ST43400N	*Elite-3*	11ms	2750mb	$2159	$2259
9.0GIG	ST4108000N	*Elite-9*	11ms	8600mb	$4699	$4799

Removable Hard Drives

FEATURING

SyQuest® REMOVABLE TECHNOLOGY

All SyQuest drives include a TWO Year Warranty. All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation.



ClubMac Removables

	Internal	External
ClubMac 44mb 5.25" (SQ555)	$199	$229
ClubMac 88c 5.25" (SQ5110C)	$379	$419
ClubMac 200mb 5.25" (SQ5200)	$559	$599
ClubMac 105mb 3.5" (SQ3105)	$319	$359
ClubMac 270mb 3.5" (SQ3270)	$549	$589



ClubMac 200mb 5.25"

$599

Introducing the NEW ClubMac 200mb 5.25" Removable Drive

ClubMac 30 DAY MONEY BACK GUARANTEE

All SyQuest cartridges cartridges include a FIVE Year Warranty.



Cartridges

44mb (SQ400)	$59
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200mb (SQ2000)	$79
105mb (SQ310)	$59
270mb (SQ327)	$89

CD-ROMs

MultiSpin 3Xp

NEC

The 3Xp combines 3X transfer rate performance, 250ms access time and a 256 KB continuous-flow cache in a compact design, making it and incredible value. At only 2.4 lbs the 3Xp is the world's lightest triple speed CD-ROM reader.



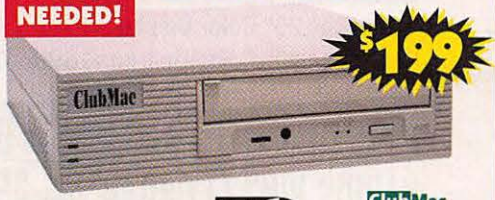
$399

NEC CD-ROM READERS

	w/o bundle	w/bundle
MultiSpin 3Xe (External, 195ms access time)	$469	$569
MultiSpin 3Xi (Internal, 195ms access time)	$439	$539
MultiSpin 3Xp (Portable, 250ms access time)	$399	$499
MultiSpin 4X Pro (External, 180ms access time)	$935	$1035

NO CADDY NEEDED!

ClubMac 2X Speed CD-ROM Reader



$199

- 320ms access time
- Double Speed performance
- Headphone jack and RCA jacks
- PhotoCD compliant

ClubMac 30 DAY MONEY BACK GUARANTEE

	w/o bundle	w/bundle
ClubMac 2X Speed (Ext., 320ms access time)	$199	$299

The ClubMac CD-ROM reader carries a ONE Year Warranty

CLUBMAC CD-ROM BUNDLE $800 VALUE



- The Animals
- Toolworks Encyclopedia v6.0
- Atlas Pack (World)
- Mayo Clinic
- Atlas Pack (US)
- QuickShot Speakers
- Lucas Game Pak

ClubMac Optical Drives

CLUBMAC NEW 3.5" 230MB FUJITSU OPTICAL



NEW!

$949

	Access Time	Internal	External
ClubMac (M25IIA) 3.5" 128mb Fujitsu Optical	40ms	$809	$839
Fujitsu (M25IIA-DYNAMO) 3.5" 128mb Dynamo	40ms		$869
ClubMac (M2512A) 3.5" 230mb Fujitsu Optical	40ms	$919	$949
ClubMac (JY-750) 5.25" 650mb Sharp Optical	40ms	$1669	$1699
MaxOptix Tahiti III (9400) 5.25" 1.3GIG Optical	19ms		$2499
Hewlett-Packard (C1716T) 5.25" 1.3GIG Optical External	28ms		$2429

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

ClubMac Tape Backup



Capacity	Model	Format	Media	Internal	External
2.0GIG	ClubMac DAT	DDS	60m, 90m	$749	$79
2-4GIG	ClubMac DAT/DC	DDS-DC	60m, 90m	$949	$99
4-8GIG	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$1329	$137
2.0GIG	HP DAT	DDS	60m, 90m	$949	$99
2-4GIG	HP DAT/DC	DDS-DC	60m, 90m	$1109	$115
4-8GIG	HP DAT/2	DDS-2	60m, 90m, 120m	$1379	$142

ClubMac DAT and DAT/DC drives include Retrospect v2.0 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. HP DAT drives carry a ONE Year Warran
The ClubMac DAT/2 & HP DAT/2 drive includes Retrospect Remote v2.0 (3-Pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty

CLUBMAC 20" TRINITRON MONITOR BLOWOUT

Monitors & Graphic Cards

radius



IntelliColor Display / 20

ClubMac Blowout Price is... $1879

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LeMansGT (0447)	$1949
PrecisionColor Pro 24X (0429)	$1349
PrecisionColor Pro 24XK (0430)	$699 *
PrecisionColor Pro 24XP (0431)	$449
PrecisionColor 24X (0421)	$824 †

MULTIMEDIA

VideoVision Studio (0418)	$3389
VideoVision Studio Upgrade (0419)	$1499
VideoVision Studio Basic (0416)	$1549

MONITORS

PrecisionColor/21 (0463)	$2049
IntelliColor Display/20 (0381)	$1879
PrecisionColor Display/20v (0427)	$1679
PrecisionColor Display/17 (0460)	$999 **
Pivot Display (0356)	$565
Full Page Display/gs (0424)	$489
TPD20gs (0436)/21gs (0437)	$799/$989

* After MFR $50.00 rebate, † After MFR $75.00 rebate
** After MFR $100.00 rebate. Offers expire 08/31/94

Purchase one of the following



$1349

PrecisionColor Pro 24X

or



$1949

LeMansGT

Get a "FREE CD-ROM READER a $469 value

NEC MultiSpin 3Xe



It's time to trade up for VideoVision Studio!

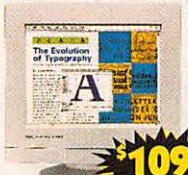
SAVE $500*

For a limited time, you can trade in your digital video board and get $500.00* from Radius when you purchase a VideoVision Studio video board.

*Offer good only with the purchase of a Radius VideoVision Studio. Mail qualifying video board, VideoVision Studio warranty registration card and a copy of your sales receipt to Radius. Offer ends 08/31/94

NEC

17" MultiSync 5FGp



$1099

MACWORLD MW EDITORS' CHOICE

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NEC Monitors carry a THREE Year Warranty.

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Silentwriter 1097 10ppm, 600 dpi, 35 fonts PS Level 2	$1379

The Silentwriter 640 carries a Limited TWO-Year Overnight Replacement Warranty
The Silentwriter 1097 carries a ONE Year Warranty

Printers

HP LaserJet 4ML Printer



$1029

- 300-dpi
- 35 PostScript fonts • 4ppm
- 4MB standard memory
- ONE Year Warranty
- Fast Intel 80960 18.8 MHz RISC processor
- PostScript Level 2

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HP DeskWriter 560C Inkjet Printer 600 x 300 dpi color, 3ppm, 35 fonts	$579
HP LaserJet 4ML Printer 300 x 300 dpi, 4ppm, 35 scalable fonts	$1029
HP LaserJet 4MP Printer 600 x 600 dpi, 4ppm, 35 scalable fonts	$1395

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DAYSTAR DIGITAL

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PowerCache Adapter*	$99

* Not req'd for IIci, IIvi, IIvx, Performa 600

Networking

ASANTÉ

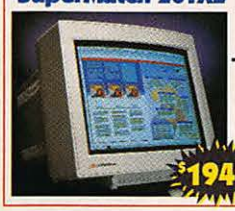
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Offer ends 8/31/94

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MoviePak2 Pro Suite (2692)	$3359
Video Expander II (2826)	$499

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Under the **"Sure Thing"™** service program, RasterOps will provide customers with next-day replacement of a faulty or defective add-on board or display product for the first year of ownership.
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SD 12x18 Standard Tablet	$959
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ES-800C Pro Mac

*FREE ASTOUND 1.0 & $50 Rebate with the purchase of an EPSON ES-800C

* Offer applies after Mail-in, MFR $50.00 Rebate Offer Ends 7/31/94



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ScanMaker IISP with Photoshop 2.5 LE	$799
ScanMaker IIHR with Photoshop 2.5	$1089

Modems

GLOBAL VILLAGE

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Gold 14,400 V.32 bis	$279 / $235
Silver 9600, V.32	$255 / $235
Bronze/Bronze II 2400, 4800, 9600 Fax	$95
OneWorld Fax Server 1 Line/AppleTalk	$865
OneWorld Fax Server 2 Line/10BT	$1299

SupraFAXModem

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SupraFaxModem 14.4 V.32bis, V.42bis w/FAXstf & Micro	$225
SupraFaxModem PB 14.4 V.32bis, V.42 Int. for Powerbook	$225
SupraFaxModem 28.8 V.Fast Class	$319

Warranties: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. Money Back Guarantee: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified. Returns: Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused. All product information and prices are subject to change without notice. Not responsible for typographical errors.

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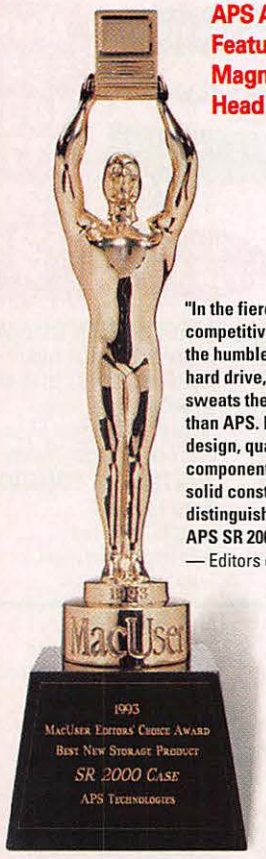
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Great Products. Priceless Support!

An APS Breakthrough...

APS Announces New Drives Featuring IBM's Breakthrough Magneto-Resistive ^{mr} Head Technology



"In the fiercely competitive world of the humble desktop hard drive, nobody sweats the details more than APS. Elegant design, quality components, and rock-solid construction distinguish the compact APS SR 2000 Case."
— Editors of MacUser

APS I^{mr} 1.0 $699*



The New APS I^{mr} 1.0 Gig

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APS I^{mr} 270[2] IBM DSAS 3270 mechanism	260MB	259	359
APS MX 290[2] Maxtor 7290 mechanism	276MB	249	349
APS MX 345[2] Maxtor 7345 mechanism	324MB	329	429
APS 340[2] 340 mechanism	327MB	279	379
APS I^{mr} 360[2] IBM DSAS 3360 mechanism	342MB	299	399
APS Q 525[2] Quantum 525 mechanism	516MB	379	479
APS I^{mr} 540[2] IBM DSAS 3540 mechanism	522MB	399	499
APS Q 540[2] Quantum 540 mechanism	516MB	399	499
APS I^{mr} 730[2] IBM DSAS 3720 mechanism	700MB	499	599
APS MS1.2AV[5] Micropolis 2210AV mechanism	965MB	759	859
1612MB - 2845MB			
APS MS1.2[5] Micropolis 2210 mechanism	1001MB	$699	$799
APS I^{mr} 1.0[5] IBM 0662 mechanism	1003MB	699	799
APS MS 4110[5] Micropolis 2210 mechanism	1002MB	699	799
APS Q 1080[2] Quantum 1080S mechanism	1029MB	749	849
APS MS 1.7AV[5] Micropolis 2217AV mechanism	1612MB	999	1099
APS MS 1.7[5] Micropolis 2217S mechanism	1682MB	929	1029
APS I 2.0[5] IBM 0664 mechanism	1920MB	1299	1399
APS ST 2.0[5] Seagate ST 125500N Barracuda mech.	2040MB	1679	1779
APS MS 2.4G[5] Micropolis 1926 mechanism	2100MB	1349	*1549
APS MS 3.0G[5] Micropolis 1936 mechanism	2845MB	1999	*2199
APS ST 9.0[5] Seagate ST410800N mechanism	1611MB	4149	*4349

Internal drives for Quadra 800 and Centris 610 available.
DATerm patent pending
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1-5 Denotes length of manufacturer's warranty
** External Case is Special Full Height Only*
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APS PB 170[1]	160MB	319	$269	$419
APS T 213[1]	202MB	319	269	419
APS PB 250[1]	240MB	359	309	439
APS T 340[1]	324MB	549	499	649
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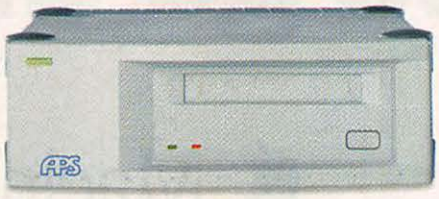
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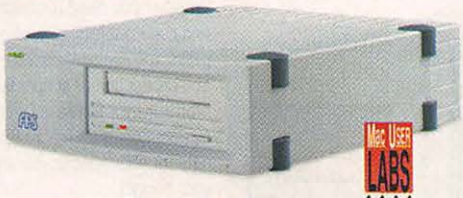


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APS Turbo DAT[2]	4-5G on 90m tape	949	999
APS HyperDAT[1]	8-10G on 120m tape	1149	1199

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.

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APS 230MB MO[1] Mechanism is Epson/Olympus Magneto-Optical OMD-230	999	1099
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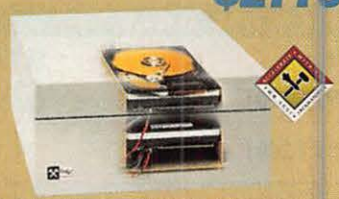
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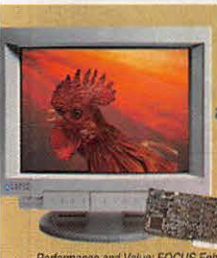
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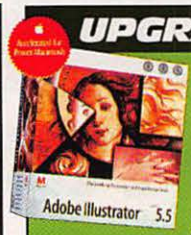
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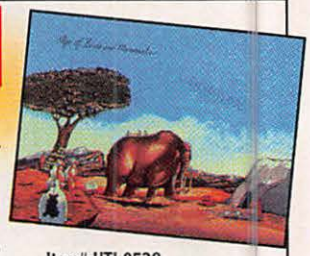
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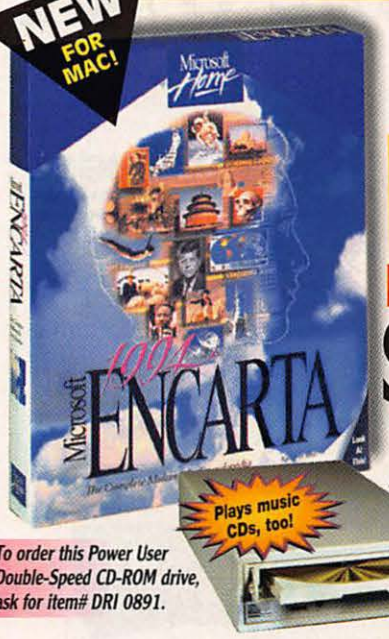


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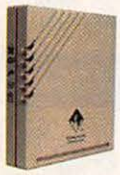
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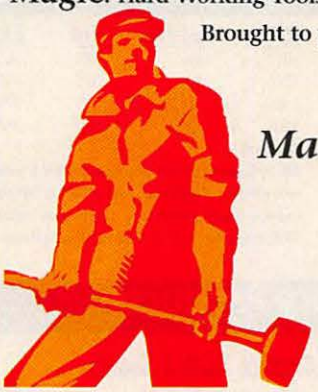


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PM8100 8/200/CD	SuperMac 20T, Keyboard	$6789
PM8100 8/200/CD	SuperMac 17, Keyboard	$5659
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SALE

TAPE DRIVES



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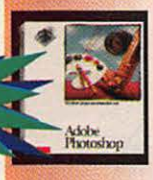
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98849	EtherThin Transceiver (AUI/TN)	$62.78
03475	Ether10-T Transceiver (AUI/10T)	$65.48
04307	Ether10-T Transceiver (AAUI/10T)	$55.10
99050	EtherMac SCSI Adaptor (TN) HDI-30	$277.41
99051	EtherMac SCSI Adaptor (TN) DB25	$261.95
99052	EtherMac SCSI Adaptor (10T) HDI-30	$277.41
03333	Ether10-T StarController	$1,035.72
05693	Ether10-T Starlet PN515-1	$261.95
00828	PhoneNET DIN 8 10PK PN310	$192.41
00832	PhoneNET DIN 8 PN308	$28.58
00955	PhoneNET DB-9 PN309	$28.58
04160	PhoneNET Connector 50pk PN350	$771.95
02779	PhoneNET Star Connector PN301	$13.90

COMMUNICATIONS/MODEMS

Global Village

99319	GlobalFax Duo Software 2.07	$77.69
99307	Global Village Teleport/Bronze II	$90.42
05686	PowerPort Bronze	$90.42
06267	TelePort Gold	$222.12
05684	PowerPort Gold	$277.61
98181	TelePort/Mercury for Desktop Macs	$277.61
98182	PowerPort/Mercury for PowerBook 1XX	$317.39
98183	PowerPort/Mercury for PowerBook Duo	$317.39
95206	One World Fax - 1 Line, Localtalk	$794.66
95208	One World Remote Acc - 1 Line, LocalTalk	$953.75
95207	One World Fax - 2 Line, Ethernet	$1,192.39
95209	One World Remote Acc - 2 Line, Ethernet	$1,510.57
96598	GlobalFax for One World 10-User Lic Pk	$198.07
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Hayes

06545	ACCURA 24 Ext	$72.53
06543	ACCURA 144 + FAX144 Ext	$169.25

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99308	Supra FaxModem 144LC Ext - Mac	$154.09
00413	Supra FaxModem V.32BIS (MC) w/Sft Cable	$222.73
96582	Supra FaxModem 288 Ext - Mac	$305.02
06865	Supra FaxModem 144PB Int - PowerBook	$214.77
96583	Supra FaxModem 288 Int - Mac PB	$305.02

STORAGE SYSTEMS

iOMEGA

95354	Iomega MacTransportable 90 (NO DISK)	$285.41
96810	Iomega MacTransportable 90 Pro	$333.14
96811	Iomega MacTransportable Multidisk 150	$468.52

PLI

96820	Infinity Optical VR 3.5 IBM	$957.95
04699	Infinity 3.5 Optical Drive (Fujitsu)	$1,071.59
04698	Infinity Opt Sony 3.5 128MB	$1,163.64
95364	Infinity 200 Removable Drive	$653.41
06547	Infinity 88/R-W 44	$495.45
96821	Infinity MAX Optical 5.25 1.3GB	$3,397.73
96822	Infinity Optical 5.25 HH 1.3GB	$2,894.32
97953	DAT 3.5 10 Gig Drive	$1,437.50
96823	Infinity 270 Turbo S	$573.86
99926	Infinity 105 Turbo S 105MB REM	$414.77

FWB

97513	CD-ROM Toolkit	$44.89
05476	Hard Disk Toolkit - Personal Ed	$44.89
00555	Hard Disk ToolKit	$120.89
99923	Hammer PE 170 MB HD	$409.82
04891	Hammer PE 340MB HD	$540.38
94110	PocketHammer 530 FMF	$1,004.59
05422	PocketHammer 1000 FMF	$1,198.05
94108	PocketHammer 1600 FMF	$1,816.98
94109	PocketHammer 2100 FMF	$2,358.56
94120	HammerTape 525MB Ext	$942.26
94121	SCSI JackHammer	$617.75

Apple Hard Drives

95346	160MB External HD	$323.86
95347	230MB External HD	$409.09
95348	325MB External HD	$448.86
95338	500MB External HD	$714.77
95339	1000MB External HD	$1,130.68

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06733	Quantum 170 MB	$211.36
97960	Quantum 270 MB	$323.86
06941	Quantum 340 MB	$369.32
01107	Quantum 540 MB	$532.95
99929	Quantum 1.0 GB	$857.95
06736	Quantum 1.2GB	$1,062.50
97991	Seagate 2.1GB Barracuda	$1,815.91

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06728	Quantum 170 MB	$278.41
97961	Quantum 270 MB	$380.68
06942	Quantum 340 MB	$460.23
01108	Quantum 540 MB	$598.86
99927	Quantum 1.0 GB	$914.77
06731	Quantum 1.2GB	$1,112.50
99168	Seagate 2.1 GB Barracuda	$2,039.77

Removable HD

06219	Syquest 44MB	$227.27
06538	Syquest 44/88MB	$329.55
99930	Syquest 105MB	$338.64
01142	Syquest 200MB	$448.86
97989	Syquest 270MB	$487.50
99187	128MB Magneto Optical	$737.50

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99174	127MB 2.5" Drive	$277.27
99175	210MB 2.5" Drive	$396.59
99176	340MB 2.5" Drive	$559.09

INPUT DEVICES

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06945	ScanMaker IISP	$755.68
06252	ScanMaker IIXE	$875.00
01120	ScanMaker IIHR	$1,051.14
06903	35T Slide Scanner	$1,323.55
01122	ScanMaker III	$2,482.95
06821	Automatic Document Feeder	$363.64
13442	Transparent Media Adapter	$585.23

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99380	DrawingSlate 6x9 Corded Pressure Stylus	$245.88
98251	DrawingSlate 12x12 Cordless Pressure Stylus	$371.88
95241	DrawingSlate 12x12 Cordless 4B Cursor	$245.88
95242	DrawingSlate 12x12 Cordless 16B Cursor	$245.88
95243	DrawingSlate 12x18 Cordless 4B Cursor	$371.88
95244	DrawingSlate 12x18 Cordless 16B Cursor	$371.88

Logitech

04258	MouseMan	$62.23
95612	TrackMan II	$72.53

Wacom

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00087	12x12 Electrostatic, Cordless Pressure Stylus	$1,070.57
03803	12x18 Electrostatic, Cordless Pressure Stylus	$1,051.25
13342	UP-201 Cordless Batteryless Pressure Sensitive Pen (UD Series)	$85.23

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97816	NEC MultiSpin 3Xp Classic Portable	$399.23
96658	NEC MultiSpin 3Xp Granite Portable	$399.23
97817	NEC MultiSpin 4X Pro	$927.16
06884	Media Vision PAS 16	$90.89
06789	Yamaha Hello! Music!	$262.24
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95518	HP DeskWriter	$195.45
95520	HP DeskWriter 520	$312.70
95522	HP DeskWriter 560C	$515.99

NEC

96746	NEC Silentwriter 640	$789.98
13111	NEC Silentwriter Model 1097	$1,419.00

Texas Instruments

12525	MicroWriter Basic	$542.05
14319	MicroLaser Pro 600 PS23	$1,437.50
14320	MicroLaser Pro 600 PS65	$1,615.91

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04605	Isobar 4 Surge Protector	$38.75
04740	Isobar 6 GS Surge Protector	$46.50
99790	Tripp Lite BC 250 UPS	$96.17
06661	Tripp Lite BC 400 UPS	$160.93
04744	Tripp Lite BC 500 UPS	$185.18

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97291	Bernoulli 150MB Cart	$87.34

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02183	Syquest 44MB Cart Unfo	$57.07
00183	Syquest 88MB Cart Unfo	$90.91
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CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
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2.4GIG	3.5"	9MS	ST12400N	$ 1525
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3.4GIG	5.25"	10MS	Elite 3	$ 2175
9.0GIG	5.25"	11MS	Elite 9	$ 4595

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CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
330mb**	3.5"	12MS	CFA340S	$ 330
545MB**	3.5"	12MS	CFA540S	$ 490
1.0GIG	3.5"	9MS	CFP1060S	$ 815

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CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
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22GIG	3.5"	9.5MS	E21680S	$ 1359

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CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
3.7GIG	5.25"	12.8MS	$ 1645	$ 1745

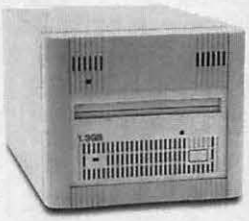
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Sony GDM-17SE1	$ 1159
Sony GDM-2038S	$ 1995
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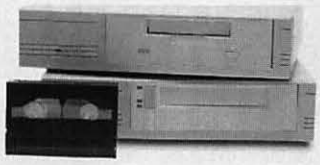
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230MB	Fujitsu	30MS	$ 945
650MB	Ricoh Hyperspace	28MS	$ 1799
1.3GB	Ricoh	40MS	$ 2459
1.3GB	Sony	40MS	$ 2299
2.0GB	Hitachi	40MS	$ 2799



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CAPACITY	MODEL	MEDIA	INTERNAL	EXTERNAL
250MB	Tandberg TDC 3660	DC6250	$ 445	$ 499
520MB	Tandberg TDC 3660	DC6250	$ 565	$ 625
2GIG	Archive 4320*	4MM	$ 839	$ 899
8GIG	Archive Turbo*	4MM	$ 1039	$ 1099
4.0-8GIG	Connor 4326 DDS2	4MM	$ 1089	$ 1149
1.3-5GIG	Exabyte 8205	8MM	$ 1539	$ 1599
1.3-10GIG	Exabyte 8505	8MM	$ 2179	$ 2279
4GB	Sony 5200 DDS2	4MM	$ 989	$ 1049
4.0-8GIG	Sony 5000 DDS2	4MM	$ 1129	$ 1189



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340MB	LPS340S	$275	$335
540MB	LPS540S	$389	$449
1080MB	EMP1080S	$739	$799
1800MB	PD1800S	$969	$1029

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External
105MB	19ms	4464	31K	Maxtor	1 Year	$469 (Type III PCMCIA)	
170MB	17ms	3600	32K	Quantum	2 Years	$179	$239
240MB	14ms	4500	256K	Fujitsu	1 Year	$309 (2.5" for Powerbook)	
270MB	12ms	4500	128K	Quantum	2 Years	$238	$298
340MB	12ms	4500	128K	Quantum	2 Years	$275	$335
530MB	13.8ms	4500	256K	Fujitsu	5 Years	$375	$435 BEST BUY!
540MB (LPS)	12ms	4500	128K	Quantum	2 Years	$389	$449
540MB (EMPIRE)	9.5ms	5400	512K	Quantum	5 Years	$509	$569
1052MB	8.5ms	5400	256K	Micropolis	5 Years	$779	$839
1060MB	9ms	5400	512K	Conner	5 Years	$749	$809
1080MB	9.5ms	5400	512K	Quantum	5 Years	$725	$785 BEST BUY!
1080MB	9.5ms	5400	256K	Fujitsu	5 Years	$725	$785
1440MB	9.5ms	5400	512K	Quantum	5 Years	NEW	CALL
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1800MB	10ms	4500	512K	Quantum	5 Years	$969	$1029
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200MB	44, 88, 200	SQ5200C	18ms	64K	2 Years	$519	$579
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Toshiba	XM3401	200ms	330KB/sec	Single disk	$349	$409
NEC	CDR510	195ms	450KB/sec	Single disk	$439	$499 BEST BUY!
Pioneer	DRM-602X	300ms	307KB/sec	6 Disc Changer	n/a	$919
Pioneer	DRM-604X	300ms	614KB/sec	6 Disc Changer	n/a	$1169
Pioneer	DRM-1804X	300ms	614KB/sec	18 Disc Changer	n/a	$2099

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2Gig	DAT	Conner	11MB/min	$839	$899
4-8Gig	DAT	Conner	88MB/min	$1269	$1329
4-8Gig	DAT	Hewlett Packard	42MB/min	$1089	$1109
4-10Gig	DDS-2 DAT	Sony	88MB/min	$1139	$1199 BEST BUY!
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1.3Gig	23ms	Hewlett Packard	512K	MultiFunction	N/A	$2679
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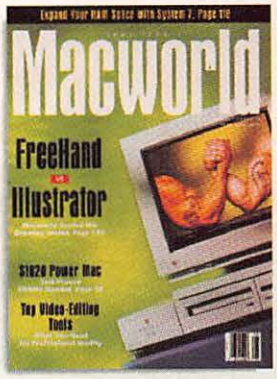


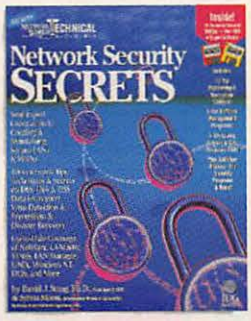
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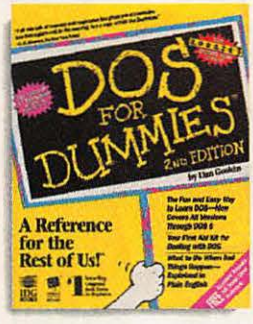
Best News Story in a Computer Publication ("DOS 6.0" by Stuart Johnson, Doug Barney and Kevin Strehlo)

Best Computer Columnist (Deborah Branscum, "Conspicuous Consumer")





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APPL 14" PLUS/Color	295/199
Apple 14T/17T	379/989
Apple 14"AV/20"T	595/1889
RADIUS 20" COLOR	1699
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Rad Prec 24XP	499
Supermac 21" Two Page	CALL
Supermac 17/20T	899/call
Supermac Thunder II	2099
Supermac Thunder 24	1669
Sony 17SE1	1129
Sony 1320/1730	339/949
Sony 2036/2038	CALL
Nec 3FGE/4FGE	595/715
Nec 5FGP/6FGP	1179/2189

Printer & Scanners

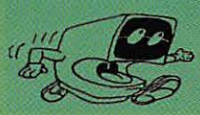
Pro 810/630	Call/1949
Select 310 / 360	639/Call
Select 320	949
Stylwriter II	289
Stylwriter port	398
Apple Color Printer	Call
HP 4ML/4MP	989/1329
HP 4M/4MPlus	1869/1949
HP DJ 1200C PS	2079
HP Deskwriter 560c	569
HP Deskwriter 520	289
HP Scanjet IIcx	929
UMAX 840	1049
UMAX 1260	1509
UMAX 1200SE	2839
Microtek Scan IIXE	969
Microtek II	635

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Seagate Baracuda 2.4g ex	1799	Quantom 250MB	249
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Quadra 610 8/230/CD	$1964
Quadra 650 8/230	$1933
Quadra 650 8/230/CD	$2248
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7100/66 8/250 CD	$2885
7100/66 AV 8/500 CD	$3620
8100/80 8/250	$3665
8100/80 8/250 CD	$3898
8100/80 AV 16/500 CD	$4882
8100/80 16/1000 CD	$5313

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HP Scanjet IIcx/IIP	$980/730
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Duo 280 12/240 Modem	$2867
Duo 280c 4/320	$3243
Duo 280c 12/320 Modem	$3708
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520c 4/160	$2632
540 4/240	$2867
540 12/240 Modem	$3494
540c 4/320	$4175
540c 12/320 Modem	$4779
Duo Dock/Duo Dock II	$477/836

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165 4/160 Modem	$2146
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Duo 270c 4/240	$2583
Duo 270c 12/240 Modem	$3055

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GV PowerPort Mercury	$329
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6100 av	8-500/1GB	3019/3269
6100 16/250	W-SoftWindows	2299
7100	8-250/500	2609/2799
7100	16-1GB/2GB	3449/3749
7100 av	8-500/W-CD	3379/3589
7100 av	8-1GB/2GB	4249/4549
7100 16/250	W-SoftWindows	3069
8100	8-250/W-CD	3749/3949
8100	8-1GB/2GB	4619/4919
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660 av	8-250/500	1399/1599
660 av	16-500/1GB	2269/2569
650	8-230/500	1949/2199
650	16-500/1GB	2499/2849
650	16-2GB/W-CD	3268/3568
610	8-160 W-DOS CARD	1499
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21" Plat (2pg Mono) $1039
SuperMatch 20t $1649
SuperMtch 21 (2pg) $2399

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Microtek IIG $459
ScanMaker IIXE $959
ScanMaker IISP $779
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8100	256/3.4	16500
8100AV	8/0	4195
8100AV	40/1.8	6595
8100AV	128/2.8	10540
8100AV	256/34	17150
8100AV	16/1.7	5395
7100	8/0	2395
7100	24/500	3295
7100	72/1.8	7395
7100	136/2.4	10795
7100AV	16/500CD	3875
7100AV	48/1.7	5495
7100AV	72/1.2	6095
7100SOFTWINDOW	16/250	3127
6100	8/0	1495
6100	8/250CD	2050
6100	16/500	2495
6100	32/1.2	3295
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605	8/230	1250
610	16/230	1895
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Power Books

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540C	12/320M	5295
540C	36/550	6295
540	4/240	2950
520C	8/160	2995
520	12/240	2895
280C	4/320	3425
280C	12/320M	3870
280	4/230	2489
180	8/80	1999
180	14/340	2695
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Newton 110	589

Apple Monitor

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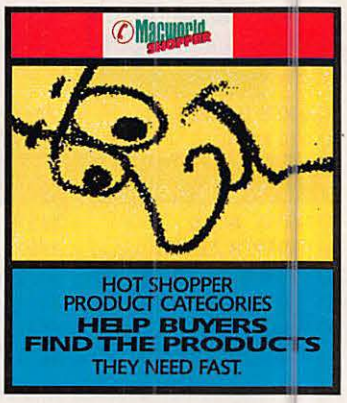
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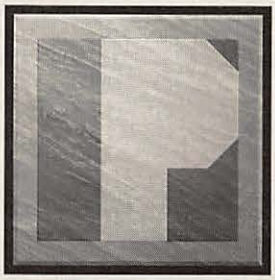
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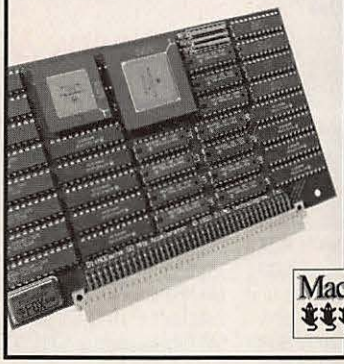
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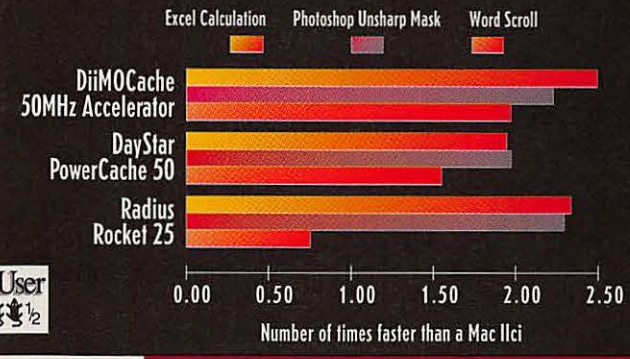
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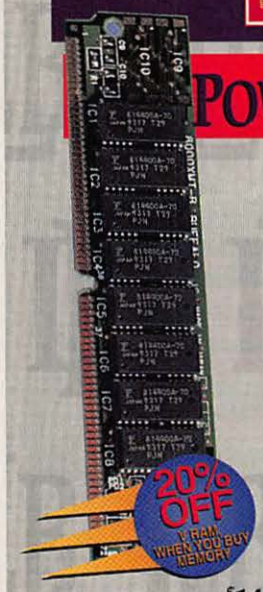
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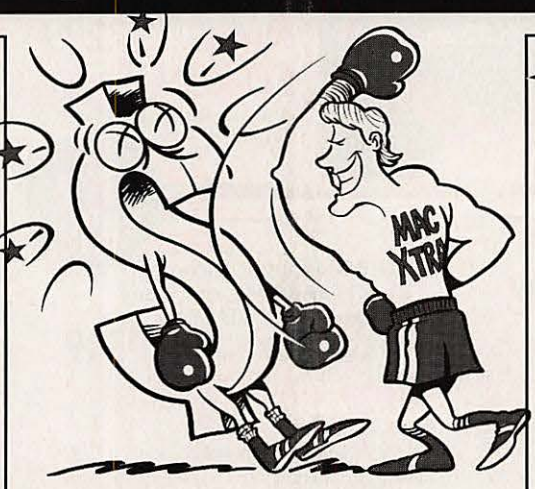
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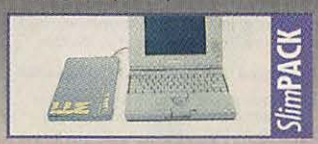
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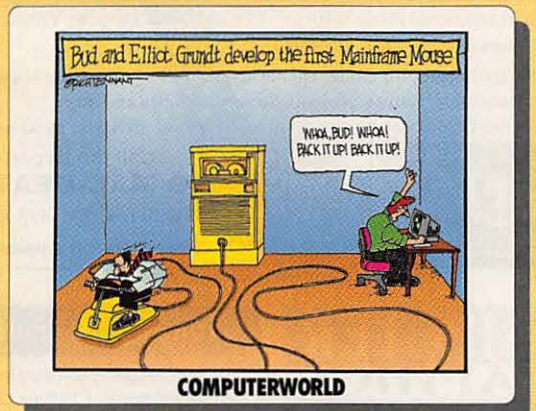
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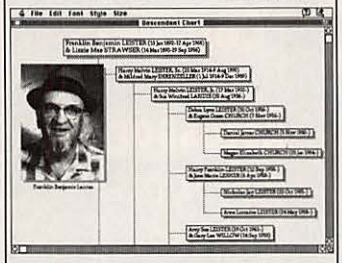
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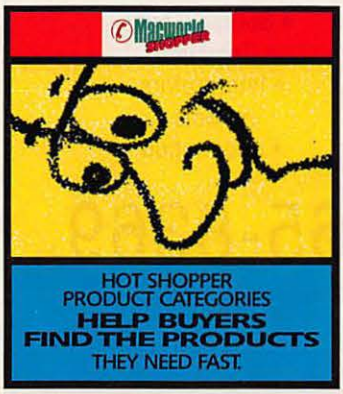
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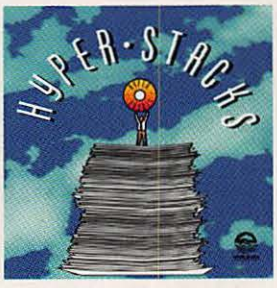
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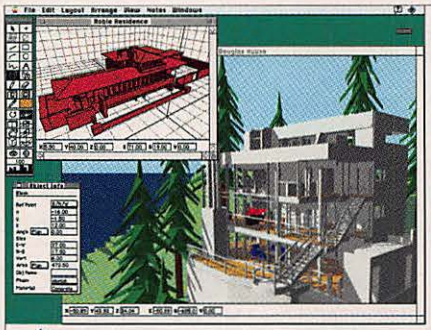
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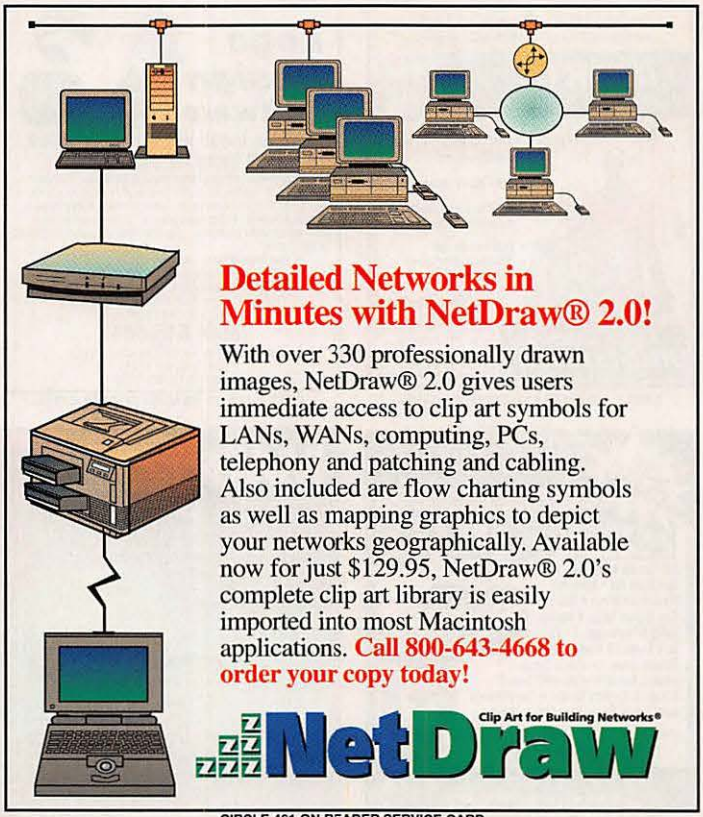


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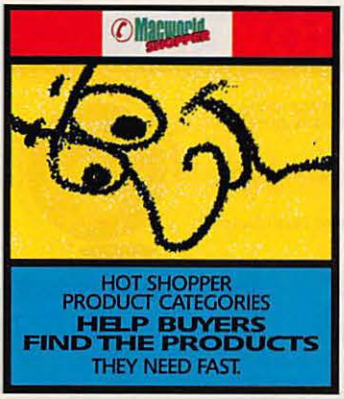
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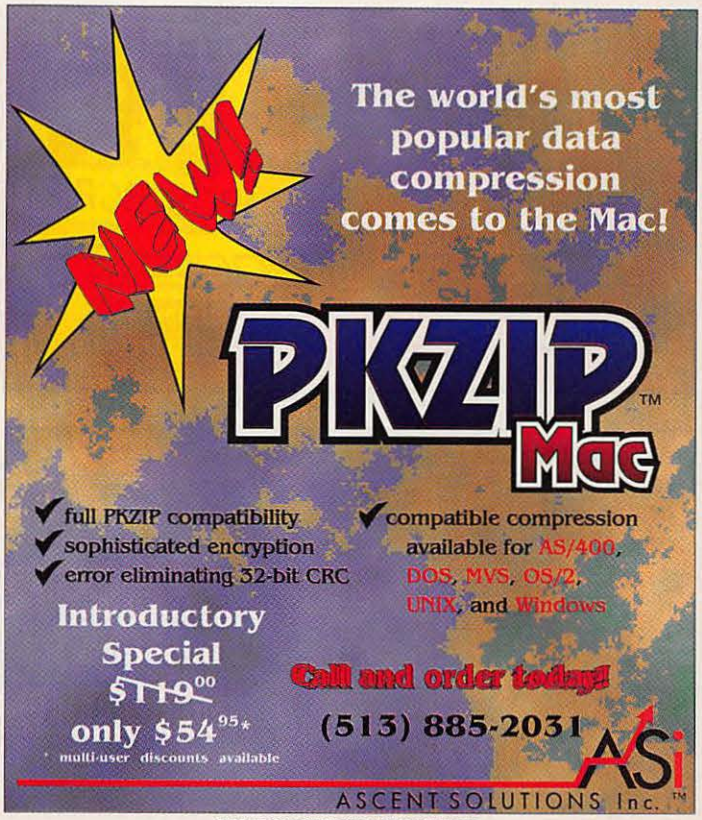
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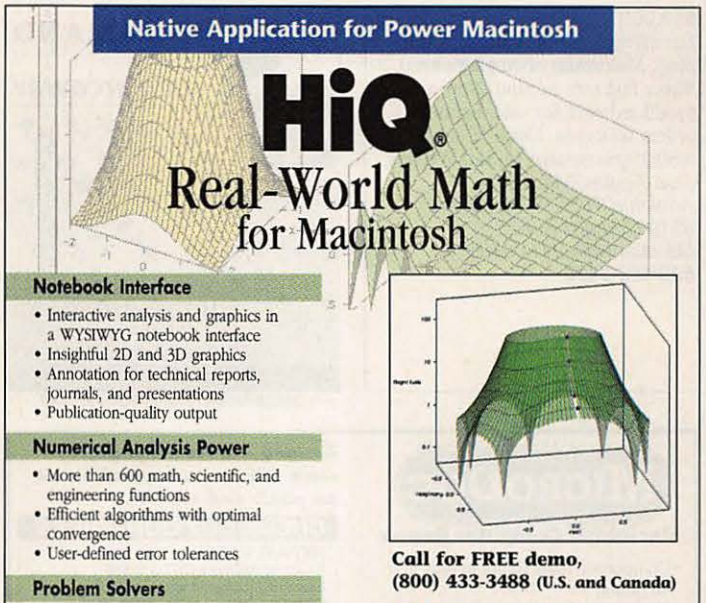
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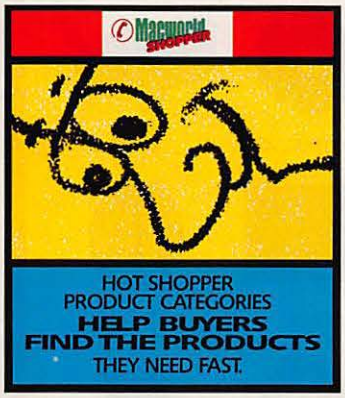


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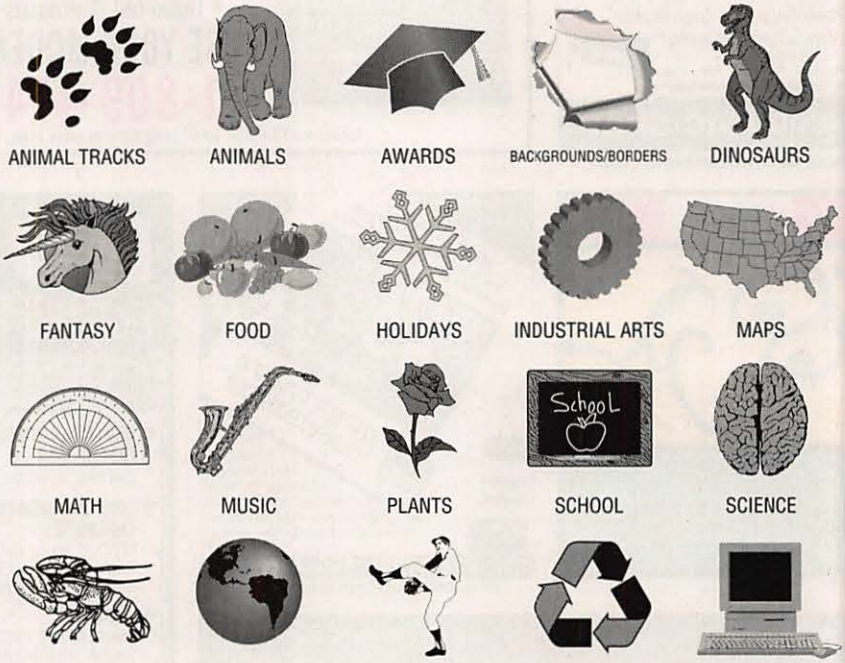
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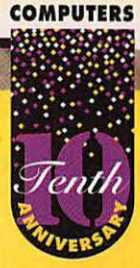
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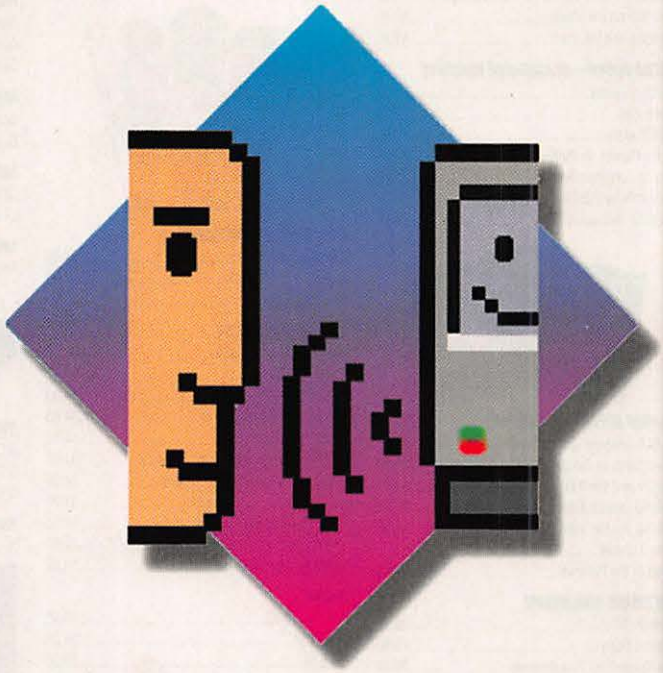
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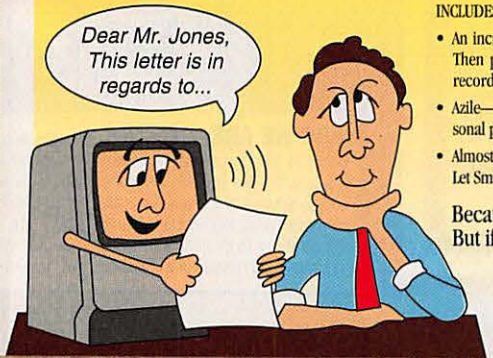


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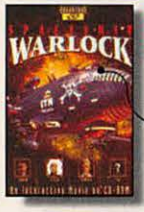
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WISE GUY

BY GUY KAWASAKI

Guy's Guide to Creativity

Lessons from the genius awards

OF ALL THE QUESTIONS THAT people ask me, the one I dread most is, "You were on the Macintosh team; where did that incredible creativity come from?" I was on the Macintosh team, and it was an incredibly creative group of people, but I wasn't one of the creative ones. I just worked hard. I have searched for years for an explanation of the creative process. At first I thought the answer was to copy Xerox PARC. Then I thought the answer was to listen to Steve Jobs. Then I thought it was to do the opposite of what John Sculley tells you. Now I've got it figured out: it's to read *Uncommon Genius—How Great Ideas Are Born*, by Denise Shekerjian ($11, 1990, Penguin Books, 201/387-0600, 800/253-6476).

The MacArthur Awards

Uncommon Genius examines the work methods of 40 winners of the John D. and Catherine T. MacArthur Foundation fellowship (the so-called genius award). The foundation was set up by John D. MacArthur. He was the Bill Gates of his day; he owned Bankers Life and Casualty—at the time the second-largest life and accident insurance company in the world—and enormous landholdings in Florida.

At his bequest, most of his $2.5 billion estate went to create a foundation that was second in assets only to the Ford Foundation. One aspect of the MacArthur Foundation's work is to encourage risk-taking and forward thinking, so each year the foundation gives about $9 million in awards.

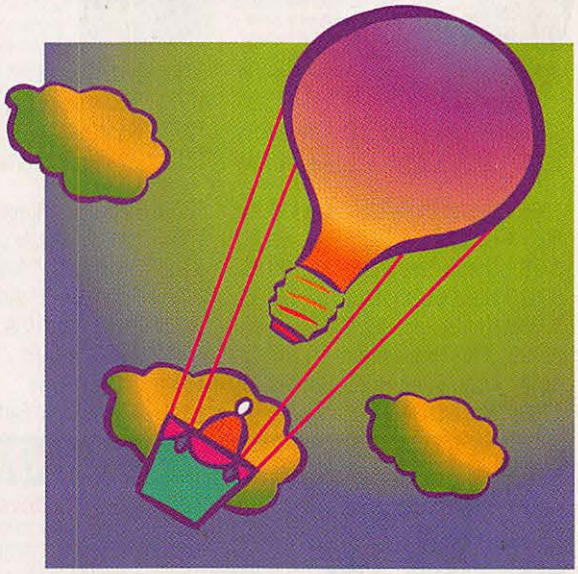
A secret committee of about 100 experts, from a wide range of fields, nominates people. One cannot apply for the award. Armed with nominations, the foundation's staff further examines the work of potential winners.

If you are selected, the foundation calls you out of the blue and tells you that you've won. Winning means you get $30,000 to $70,000 a year for five years. The purpose of the money is to catalyze quantum leaps in creativity by providing financial freedom. There are no strings attached; you can do whatever you want with the money.

Lessons in Creativity

Most books about creativity are cuties with exercises, brainteasers, and cartoons (like *The Macintosh Way*). They're supposed to tickle you into creativity. Then there's Shekerjian's book. It is a complete, radical, and welcome departure from any book I've ever read about creativity.

Uncommon Genius has 14 chapters, each explaining one aspect of creativity by examining how MacArthur award winners do their thing. Award winners are not limited to the arts or a narrow concept of creative fields. For example, Shekerjian writes about a woodworker, an environmentalist, a translator, and a neurophysiologist (you're probably as amazed as I am that there's no HyperCard programmer on this list).



The main point of the book is that creativity is not a brilliant flash from heaven after the clouds part. Shekerjian found that the MacArthur award winners find something they're good at and work at it for years, take risks because risks are part of change, and endure years of uncertainty and frustration. Truth be known, this is an accurate description of how Macintosh was created.

Two pearls of wisdom in *Uncommon Genius* will strike at the heart of any Macintosh owner.

Pearl one: "There are no secrets, no inside easy steps that everybody hopes for. We all want to find the secrets, but they just don't exist," says MacArthur award winner Shirley Brice Heath, anthropological linguist.

Have you ever had a friend or relative who buys his or her first Macintosh, takes it home, sets it up, and expects to be the world's greatest graphic artist—or writer or businessperson—in an hour? You have? Then you know what Shirley's talking about.

Pearl two: "I don't get too excited by my victories or too disappointed by my defeats, and in that way I come closer to peace of mind and that deep inner place that creativity comes from," says award winner Michael Lerner, social scientist.

Does Apple's whipsaw management style drive you crazy? One day the company is arrogantly crowing that it's introduced a new computer. The next day it lays off 2000 employees because earnings per share are down for the quarter.

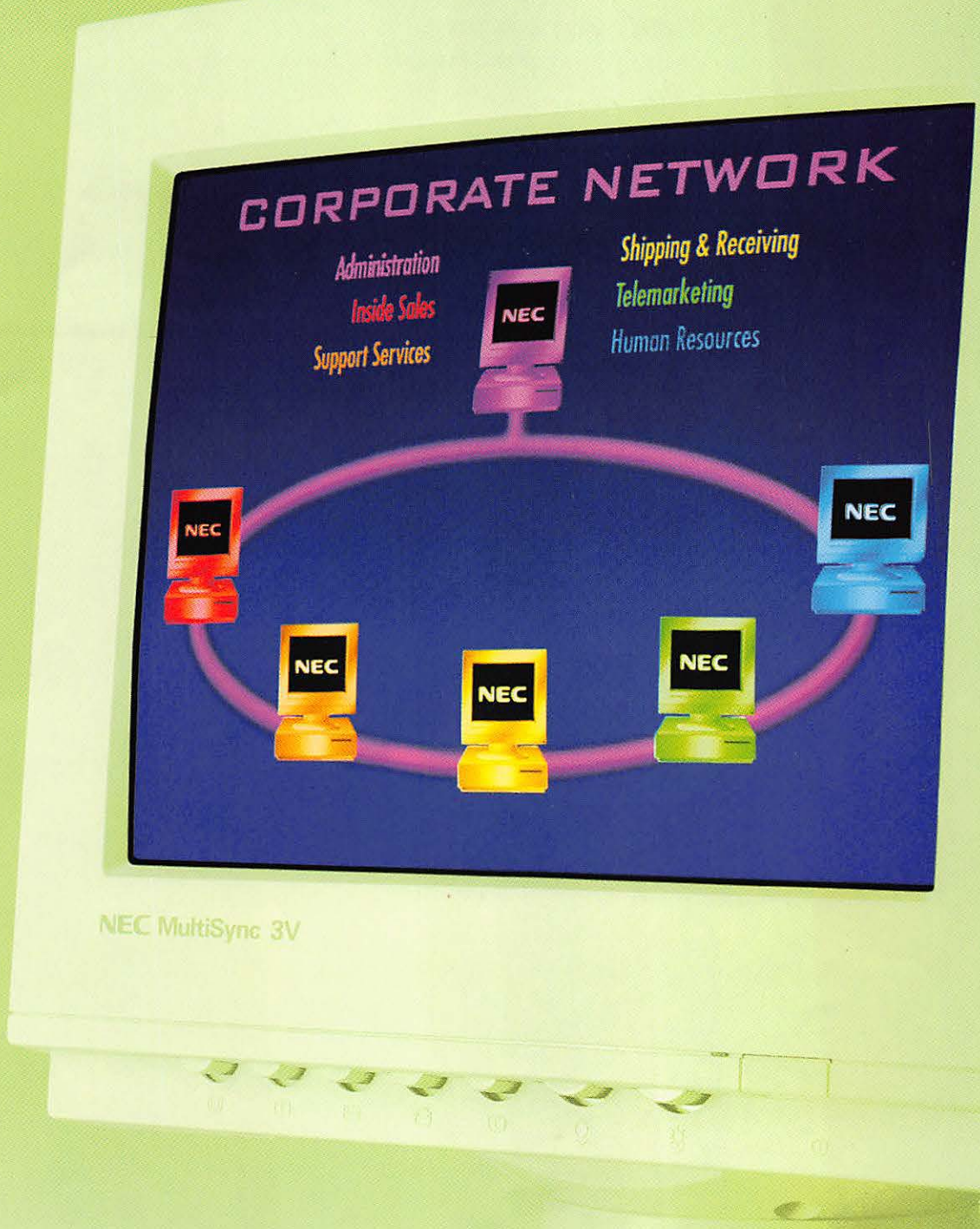
Oy vey. If we could only get Apple execs to listen to Michael. Apple is completely dependent on creative products, so it needs to cultivate a "deep inner place" in order to survive.

The Close

Buy this book. It'll help foster greater creativity in everything you do with your Mac. And more important, I won't have to try to explain creativity anymore. m

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His latest book is *Hindsights* (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at Kawasaki@radiomail.net.

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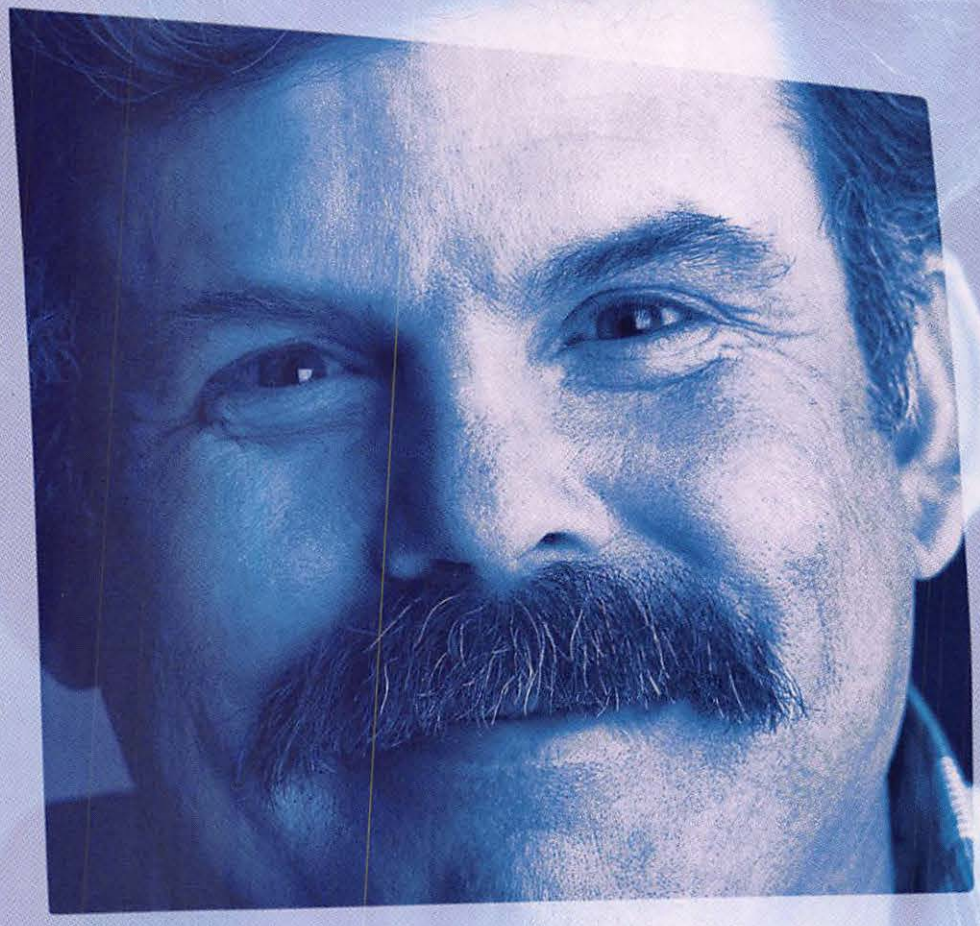


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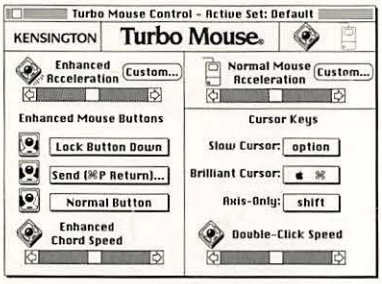
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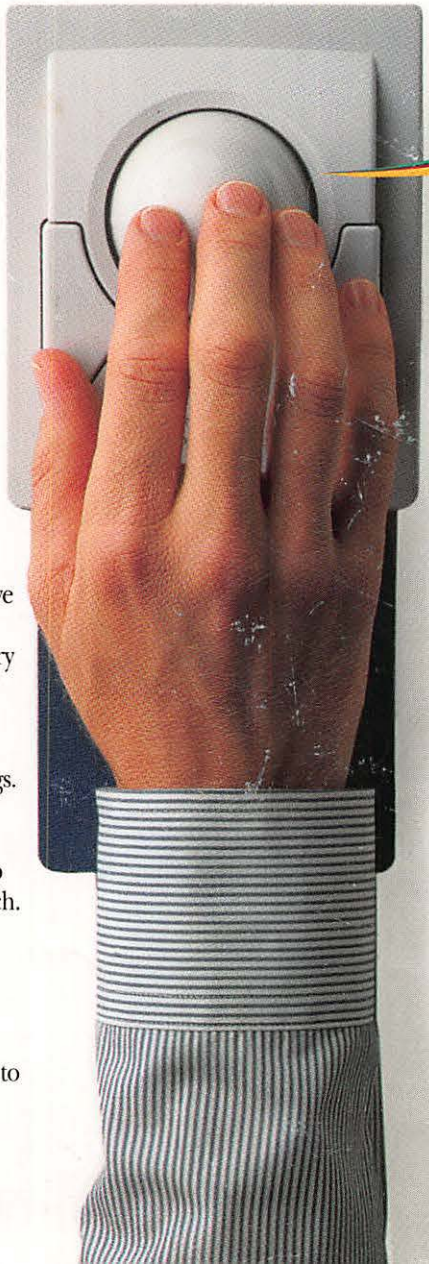
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Turbo Mouse has a large comfortable ball that rests on high-quality stainless steel bearings. The movement is ultrasmooth. Precise.

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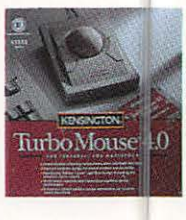
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